BUREAU OF HYGIENE AND TROPICAL DISEASES.

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HELMINTHIASIS.

KHALIL (M.). **The Effect of the Period of Service upon Parasitic Infection amongst the Cairo City Police Force.**—*Jl. Helminthology.* 1926. Aug. Vol. 4. No. 3. pp. 115–122. With 3 graphs.

The Egyptian Police represent the healthiest section of the inhabitants and are drawn mostly from the poorest agricultural and artisan classes. On joining, the policeman is subject to two factors not found in his previous civil life; i.e., he is well dressed and shod, and is not subject to re-infection with helminths. Stools were examined by smear (for Bilharzia and other parasites) and by the flotation technique previously described by the author (for hookworm). Urine also was examined.

Of 5,366 urines examined, 21·5 per cent. showed *S. haematobium* and ·1 per cent. *S. mansoni*; while of 5,322 stools examined, ·1 per cent. showed *S. haematobium*, 1·5 per cent. *S. mansoni*, ·5 per cent. *H. nana*, 16·5 *Ancylostoma duodenale*, 5 per cent. *Ascaris*, 2·3 per cent. *Trichostrongylus*, and in smaller percentages, *T. saginata*, *Oxyuris*, Whipworm, and *Strongyloides*. 62·8 per cent. were negative. The highest infections were in those previously engaged in agriculture (41·2 per cent.) followed by village artisans (20 per cent.) and town artisans (18·5 per cent.). Grouped according to length of service, the infections fell from 79·4 per cent., for those of less than three months to 14·4 per cent. for those of over 20 years. *S. haematobium* for the same range dropped from 46 per cent. to 4·4 per cent. *S. mansoni* infections all came originally from Lower Egypt, a result in agreement with Khalil's previous reports, and the distribution of Planorbis. Clinically, this disease is much more serious than *S. haematobium* infection. Ancylostoma infection fell from 47·8 per cent. to 3·9 per cent. for the above periods.

T. W. M. Cameron.

EMILY. La parasitose intestinale chez les tirailleurs indigènes du corps d'armée colonial. [**Intestinal Parasites in Native Troops of the French Colonial Army.**]—*Ann. de Méd. et de Pharm. Colon.* 1926. July-Aug.–Sept. Vol. 24. No. 3. pp. 370–383.

The parasites of the French colonial troops quartered in Strasburg have been found by Emily to be as follows:—

Malagasy.—Of 1,206 examined, hookworms were found in 44 per cent., Ascaris in 38 per cent., whipworms in 22 per cent., *S. mansoni* in 17·5 per cent., Taenia in 4 per cent., and Strongyloides in ·5 per cent.

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Senegalese.—Of 875 examined, hookworms were present in 60 per cent., Ascaris in 5·7 per cent., whipworms in 2·4 per cent., Taenia in 5·5 per cent., *S. mansoni* in 3·5 per cent., and Strongyloides in ·2 per cent.

Indo-chinese.—Of 906 examined hookworms were found in 66 per cent., Ascaris in 41 per cent., whipworms in 52 per cent., Taenia in 1·1 per cent., and Strongyloides in 1 per cent.

He points out the military importance of these infections, and suggests suitable prophylactic and sanitary measures.

T. W. M. C.

KOBAYASHI (Harujiro). **Parasitic and Endemic Disease in Chosen.**—*Mitt. d. Med. Akad. zu Keijo.* 1926. Vol. 9. No. 3 & 4. 6 pp. With 2 charts.

Apart from paragonimiasis it would appear that clonorchiasis is one of the most important infections in Korea. The following regions are known to be endemic foci: (1) Riri, North Zenra-Do; (2) Kampei, South Zenra-Do; (3) Taikyu, North Keisho-Do; (4) Shinshu, South Keisho-Do; (5) Shin-ei and Kinkai, South Keisho-Do. The location of these centres is indicated on a line map and it is noticeable that the infection is absent from the northern half of the Peninsula.

Of the tapeworms, *Taenia saginata* is very common all over the Peninsula (but absent in the vicinity of the city of Keijo), while *T. solium* is rare. *Dibothriocephalus latus* is not rare on the east and south coasts. Its occurrence coincides with the distribution of *Oncorhynchus perrvi*, which is the only known intermediary in the Far East.

Hookworm is common in the south and diminishes gradually to the north. *Necator americanus* is less common than *Ancylostoma duodenale* and is absent in the north. *Ascaris lumbricoides* prevails everywhere. *Trichuris trichiura* is very common in the south, less so in the north. *Oxyuris vermicularis* is not rare. Filariasis and elephantiasis occur in the southern half, especially in Chusei-Do and Zenra-Do. Schistosomiasis and trichinosis are unknown in Korea. Some cases of *Heterophyes heterophyes* and *Metagonimus yokogawai* are known. *Trichostrongylus orientalis* is common in the southern part but absent from the northern. (The paper concludes with a citation of statistics from various Japanese authors).

R. T. Leiper.

NAUCK (Ernst G.) & SHAN YU. Zur Frage der Verbreitung von Wurmparasiten in Mittel-China. [**The Distribution of Helminths in Central China.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 503–510. [7 refs.]

The chief source of infection with helminths in Central China in human excrement and so ascaris and whipworm are common. Other parasites include hookworm, Strongyloides, Trichostrongylus, Oxyuris and *Filaria bancrofti*. Trichinella is apparently absent, although a single case has been reported from Peking. The flatworms include *Schistosoma japonicum* and *Clonorchis sinensis* (a frequent canine and feline, but rare human parasite). *Fasciola hepatica* occurs in sheep and buffaloes. *Sparganum mansoni*, *Taenia saginata* and *T. solium*, Hydatid and *Hymenolepis nana* are also found.

T. W. M. C.

YANO (S.), SHIMIZU (T.), SHIRAI (S.) & KANEKO (T.). Ueber die Verteilung der Parasiten in der Nähe von Mukden. [**Distribution of Parasites in the Mukden Region.**]—*Jl. Oriental Med.* 1925. Nov. Vol. 4. No. 1. German summary p. 9. [In Japanese.]

650 persons in Mukden examined in the summer of 1924 showed the following infections :—

Ascaris lumbricoides	429 (66 per cent.)
Trichocephalus	162 (2·5 [? 25] per cent.)
Ankylostomes	6 (0·9 per cent.)

The eggs of *Taenia solium* occurred in two cases and in one instance each, eggs of *Dipylidium caninum*, Oxyuris, *Trichostrongylus orientalis*, and *Clonorchis sinensis* were noted.

R. T. L.

PAPANDREA (F.). Sulla frequenza dei parassiti intestinali nei bambini. [**The Incidence of Intestinal Parasites in Children.**]—*Pediatria.* 1926. Oct. 15. Vol. 34. No. 20. pp. 1125–1127. [9 refs.]

The author examined the faeces of 200 children at Messina for the presence of helminthic ova. He divides the children into three groups : those in their first childhood, of which there were 44 ; those in the second, 60 ; and those in the third, 94. [These terms are not defined. We are accustomed to speak of a second childhood, but not in reference to infants.]

Of the whole 200, 126, or 63 per cent., were found to be harbouring intestinal parasites.

Six of the first group were passing ova : three those of *Trichuris trichiura*, two *Ascaris lumbricoides*, one *Oxyuris vermicularis*. One of the six was breast-fed only ; the others had artificial feeding in addition.

Forty-one (68·3 per cent.) of the second group were positive : Ascaris alone was the most frequent, 20 per cent., Trichuris next, 18·3 per cent., Ascaris and Oxyuris together in 15 per cent.

In the third group there were 79 positive (84 per cent.). As in the second, Ascaris was commonest (34·1 per cent.), Trichuris next (22·3 per cent.), Ascaris and Oxyuris again being third on the list with 16 per cent. Infestation with all three was found in 5·3 per cent. *Taenia solium* was found in this group only, on two occasions.

H. Harold Scott.

REMLINGER (P.). Sur l'absence de la bilharziose et de la rareté de la filariose à Tanger. [**The Absence of Bilharziasis and Rarity of Filariasis at Tangier.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 487–497. [26 refs.]

Although bilharziasis is found in several spots in Morocco, Remlinger considers that it is absent from the Tangier area in spite of the presence of *Planorbis dafourii* and *Bullinis contortus*.

Filariasis is either absent from the same region or is so rare as to be exceptional, although elephantiasis and chyluria are not rare.

R. T. L.

PAVLOVSKY (E. N.). **On the Epidemiology of Helminthiasis.**—*Rev. Microbiol. et Epidémiol.* 1926. Vol. 5. No. 3. English summary p. 229. [In Russian pp. 125–132.]

This is a short résumé of the methods by which helminths enter the body of man. The writer divides them into three classes : Those entering actively (Schistosomes, Hookworms, and Strongyloides) ; those entering passively (the great majority) ; and those carried by transmitters (the Filaria worms, etc.). Prophylactic measures are suggested for each type of parasite.

T. W. M. C.

NEVEU-LEMAIRE (M.). Helminthiases pulmonaires et bronchites vermineuses. [**Helminthic Infections of the Lung and Verminous Bronchitis.**]—*Le Bull. Méd.* 1926. Jan. 27, 30. Vol. 40. No. 5. pp. 116–120.

This is a valuable résumé of the helminthic infections of the lung in man. The author deals with the biology, symptoms, diagnosis and treatment of Paragonimus, Hydatid, and other lesser parasites together with the forms of parasitic bronchitis caused by the migrating larvae of Ascaris and hookworms. The article is of too general a character to permit of adequate abstraction and should be consulted in the original.

T. W. M. C.

DAUBNEY (R.). **The Diagnosis of Intestinal Helminth Infestation.**—*Kenya Med. Jl.* 1926. Aug. Vol. 3. No. 5. pp. 122–131. [11 refs.]

This is a discussion of the laboratory methods of examining faeces for the presence of ova. The methods discussed are the smear, sedimentation, flotation and the Lane technique. The author considers that the last is the best of the centrifugal flotation methods and is one which has given in his hands consistent results, especially with light infections.

T. W. M. C.

BRAILSFORD (J. F.). **The X-Ray Diagnosis of Animal Parasites (Helminthes) in Man.**—*Proc. Roy. Soc. Med.* (Sect. of Electro-Therapeutics). 1926. Aug. Vol. 19. No. 10. pp. 41–52. With 9 text figs. [37 refs.]

This is a review of the helminthic parasites which can be diagnosed by the assistance of X-rays. The chief parasites discoverable in this way are hydatid cysts and cysticerci and the article is largely devoted to a consideration of the appearances presented by these parasites. Others which have been seen by means of X-rays are calcified Trichina, Paragonimus, Onchocerca, Ascaris and Bilharzia.

T. W. M. C.

HALL (Maurice C.). **Developments in Anthelmintic Medication.**—*Amer. Jl. Trop. Med.* 1926. July. Vol. 6. No. 4. pp. 247–260.

Hall divides anthelmintic medication into three periods—a stage of uncritical empiricism which lasted for centuries ; a stage of increasingly

critical empiricism lasting for under half a century; and the present stage of critical experimental investigation. In the first stage, the worms mainly considered were the human Taenias and the drugs still in use are in the main derived from the old plant drugs of this epoch. This stage passed into the next stage with the growing interest created by the discovery of the hookworm and various investigations into the value of various drugs, including thymol, betanaphthol, and chenopodium, were attempted. The obvious need for critical tests and the development of the modern techniques for the examination of faeces ushered in the present stage. Hall points out that faecal examinations tell nothing of larval, immature, male or old female worms and that we are still without accurate means for determining the number of adults present in a patient from an examination of the stool. The need for exact knowledge is emphasized, and this can only be obtained by experimental methods. These methods were inaugurated forty years ago by GRASSI & CALANDRUCCIO and by PERRONCITO when they established a satisfactory treatment for liver fluke in sheep by means of male fern. This method was later developed by RANSOM and Hall and has resulted not only in dependable treatment for most of the helminthic conditions of man and the domestic animals, but in the extended use of carbon tetrachloride for hookworm disease and the introduction of the new tetrachlorethylene. Hall points out that parasitology has been very largely neglected in American medical schools and pleads for a more thorough study of the subject in the ordinary medical course.

T. W. M. C.

HALL (Maurice C.). **Some Practical Principles of Anthelmintic Medication.**—*Jl. Parasit.* 1926. Sept. Vol. 13. No. 1. pp. 16–24.

The essential factors in anthelmintic medication are, according to Dr. Hall, practitioner, patient, parasite, parasiticide, purgative, and prophylaxis.

The *Practitioner* is the key factor to all the others, with which he must be acquainted. Hall claims that the American practitioner (human or veterinary) is handicapped by a lack of suitable training. In deciding the drug and the dose to be administered, the practitioner must consider the *Patient*, his age, size, sex, food, habits and general condition. In general, human patients, dogs and cats can be given a light evening meal and treated three of four hours before the morning meal, nothing being gained by a longer fast. Pigs require at least 24 hours fasting, while ruminants need only be fasted overnight. Horses, on the other hand, require 36 hours for parasites in the large intestine, and 12–24 for parasites in the more anterior parts of the alimentary canal. The nature of the food is important. Alcohol in general is inadvisable and alcoholism is a special contraindication for carbon tetrachloride. Carbohydrates are advisable with drugs of this type. Fats are contraindicated (except castor oil with chenopodium) and some, such as olive oil with chenopodium, are actually dangerous as they tend to remain in the stomach and favour absorption of the drug. A knowledge of the *Parasite*, its habits and habitat are, for obvious reasons, also necessary. The *Parasiticide* (poison) should be well understood and should not be used until the diagnosis is certain. Chenopodium is more effective against Ancylostoma and Ascaris

while carbon tetrachloride is more effective against Necator and the ankylostomes and ascarids of the dog. Male fern destroys Fasciola but not Dicrocoelium. Tartar emetic or emetine will kill the blood flukes but not *Filaria bancrofti*. We are just entering on the stage in anthelmintic medication when data about the chemical composition and the anthelmintic value of drugs are becoming available. He considers that the now academic difference between vermicide and vermifuge should no longer be employed as it has no practical value. Contraindications depend on the patient and the drug used. General contraindications are extremes of age, febrile and debilitating conditions, gastro-enteritis, gross helminthiasis, high fatty diet, and such conditions as gastric stasis or pronounced constipation. Chenopodium is irritating, depressing and constipating ; carbon tetrachloride tends to produce acute yellow necrosis of the liver ; beta-naphthol destroys the red blood cells. In these cases the contraindications are obvious. Carbon tetrachloride is safe in pregnancy while the others, with thymol, are not ; but it should not be used in gross ascariasis as it tends to cause a fatal intestinal obstruction with atony of the intestine ; in ascariasis accompanied by gastro-enteritis, santonin should be used. In addition to the parasiticide, the practitioner must consider the *Purgative* (prompt purgation is protective). Many combinations are found to be effective in general practice, e.g., chenopodium and castor oil, carbon tetrachloride and epsom salts, santonin and calomel, and so on. Dogs will survive lethal doses of male fern or chenopodium if given with castor oil. Large doses of the purge should always be given and early purgation is essential, within 24 hours. All worms, of course, are not necessarily passed in this time and they may continue to be passed for a week or so. The final factor, *Prophylaxis*, depends on a knowledge of the life-history—ascariasis involves " coprophagy " and a lack of sanitation ; hookworm infestation means skin infection which means skin exposure with concomitant lack of sanitation ; trichinosis implies eating of improperly treated pork ; filariasis indicates attack by mosquitoes and so on.

[This article is not a long one, but it merits the serious consideration of all practitioners who may have to deal with helminth parasites.]

T. W. M. C.

HALL (Maurice C.) & SHILLINGER (Jacob E.). Eine neue Methode zur Untersuchung der Wirkung der Antihelminthika mit besonderer Berücksichtigung des Merkurochrome. [**A New Method of testing the Action of Anthelmintics, with Special Reference to Mercurochrome.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 391–396.

During the past ten years, Hall and Shillinger have tested anthelmintics by administering them to an animal, collecting, counting and identifying the worms passed. The animal is then destroyed and the number remaining is ascertained. Following this method mercurochrome 220, in 1·5 gm. capsules, was administered to dogs (up to 40 capsules being given to a single dog). The drug has an average of 88 per cent. efficiency for whipworms, but in some animals it removed 100 per cent. It is only slightly effective for ascaris and tapeworms, and not at all for hookworms.

T. W. M. C.

HALL (Maurice C.) & SHILLINGER (Jacob E.). **Gastro-Intestinal Lavage with Water at Comparatively High Temperatures for removing Worms from Dogs.**—*Amer. Jl. Trop. Med.* 1926. Sept. Vol. 6. No. 5. pp. 341–346. [4 refs.]

Hall and WIGDOR in 1918 showed that water at body temperatures is quite ineffective in removing intestinal worms from dogs. Experiments with water at 47°–48° C., administered in amounts of 4, 3, 2½, and 2 gallons, removed 97·7 per cent. of ascaris, 77 per cent. of hookworms and 51·6 per cent. of tapeworms but resulted in the deaths of about half the animals used. They suggest that possibly water at 45° C. in quantities not exceeding 2 gallons might be of value in dogs.

T. W. M. C.

HEYDON (G. M.). **Notes on the Treatment of the Intestinal Parasitic Worms which may be met with in Australia.**—*Med. Jl. Australia.* 1926. July 10. 13th Year. Vol. 2. No. 2. pp. 39–44.

The result is recorded of the treatment of the various helminthic conditions met with in Australia. Both species of hookworms occur but Necator is the commoner and much less harmful than Ancylostoma. The dosage, use and toxicology of oil of chenopodium, carbon tetrachloride and a mixture of these drugs is discussed. It is considered that carbon tetrachloride is the most effective against Necator; chenopodium comes next for hookworms in general and is useful against Ascaris; while the mixture is the best medication yet discovered for a mixed infection. Ascaris is best treated with santonin, although oil of chenopodium (or ascaridol) is also very good. Oxyuris, Trichuris, Hymenolepis, Taenia and their appropriate treatment are also discussed.

R. T. L.

KUDICKE (Robert) & WEISE (Wilhelm). Untersuchungen ueber die wurmtötenden Eigenschaften von Halogenverbindungen des Mathans, Athans und Äthylens. [**The Vermicidal Properties of Halogen Compounds of Methane, Ethane and Ethylene.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. June 1. Vol. 30. No. 6. pp. 231–239. [12 refs.]

Strongyloides larvae were only killed by the gases of tribromethane, tetrachlorethane, dibromethane and also by tetrachlorehylene in strong concentrations, though all the substances with the exception of ethylbromide were proved active.

The action of the aqueous solutions was found to be inversely proportional to the solubilities of the substances. The strongest were tribromethane, tetrachlorethane and tetrachlorethylene. As a whole the bromine compounds were found stronger in action than chlorine compounds.

R. T. L.

DA COSTA (S. F. Gomes). Action des camphres sur les helminthes. [**Action of Camphor, Hexatone, and Sodium Salicylate on Helminthes.**]—*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. pp. 1273–1277. With 3 text figs. [7 refs.]

——. Action de l'hexétone sur les helminthes.—*Ibid.* pp. 1277–1279. With 2 text figs. [11 refs.]

——. Action du salicylate de sodium sur les helminthes et le coeur isolé.—*Ibid.* pp. 1280–1283. With 3 text figs. [2 refs.]

Da Costa has studied the action on Ascaris of the camphors, a group the anthelmintic values of which have been little investigated. Of the three isomers of camphor, the right is least, and the left most active. His *in vitro* experiments indicate that "left" camphor ought to be studied as an anthelmintic. Hexatone has a considerable anthelminthic action.

T. W. M. C.

SHIRAI (Mitsuji). **On the Intermediate Host of** *Fasciola hepatica* **in Japan.**—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1925. Vol. 4. pp. 441–446.

The liver-fluke, *Fasciola hepatica,* is a common bovine parasite in Japan. Shirai finds that the intermediate host there is *Lymnaea pervia.* Miracidia were obtained from eggs in the gall bladder of cattle. They also penetrate *L. auricularia,* but do not develop in that host. Cercaria emerge about a month after infection. Experimental infections with rabbits and guineapigs showed that the young flukes penetrated the gut wall into the peritoneal cavity in order to reach the liver. Numerous haemorrhagic patches could be afterwards found on the intestine.

T. W. M. C.

BARLOW (Claude Heman). **The Life Cycle of the Human Intestinal Fluke** *Fasciolopsis Buski* **(Lankester).**—*Amer. Jl. Hyg.* Monographic Series No. 4. 1925. July. 98 pp. With 1 map, 12 text figs, 5 charts & 10 plates.

In the Shaohsing region of the Chekiang Province of China Fasciolopsis is more severe and occasions greater economic loss than hookworm and schistosomiasis together. In some villages 100 per cent. of the inhabitants are infested. The author estimates that the lives of as many as 1,500,000 people are profoundly affected. The wealth of material available at Shaohsing indicates that the various species listed by BROWN (1917) are unwarranted and are due to differences of treatment and preservation. NAKAGAWA (1920) first worked out the life history of the parasite in Formosa where it prevails much more in pigs than in man. In Shaohsing the author failed to find the parasite in native pigs and there is a local saying "where man has fluke disease, pigs do not; where pigs have fluke disease man does not." In 1923 the author gave a preliminary report of his observations and these are elaborated in the present monograph with an added wealth of observations and illustrations.

Extending over nearly a hundred pages of text with twelve text figures and 10 plates the present monograph will undoubtedly rank as a classic on this infestation. The author's summary gives but a slight

indication of the numerous and new important observations in the paper. It contains the following of general interest. The ova are readily killed by drying, and by lime in weak solution. The development within the egg to the miracidial stage occupies generally 22 days. The optimum temperature for incubation is 80° to 90° F. The miracidium has two pigmented eyespots and two flame cells. The head is spined and the author describes a mouth which is probably patent. The free-swimming miracidium lives only 6 to 9 hours in warm weather, but may live as long as 52 hours in cool weather, although by that time it has lost power of penetrating its snail intermediary. The miracidium is killed by lime 1 in 10,000 and by copper sulphate 1 in 1,000,000. The intermediaries at Shaohsing are *Planorbis schmackeri* and *Segmentina nitidella.* Dead snails are not penetrated by the miracidia. Some development was obtained by keeping miracidia and sporocysts in filtered snail serum in micro-culture slides. Rediae form in sporocysts within 3 or 4 days and emerge in 9 to 10 days. The mother rediae were obtained as early as 8 days and as late as 254 days after experimental infection. The mother rediae never produce cercariae. Daughter rediae appeared as early as 13 days from infection. As many as 45 cercariae have been counted in a daughter redia. The cercaria is single tailed and is spined. The free swimming stage is brief. Encystment occupies from 1 to 3 hours. The inner wall of the cyst resists hydrochloric acid but is dissolved by intestinal juices. Forty-nine days elapse from date of infection of the snail to the encystment.

The encystment takes place on water-grown plants, especially the water-caltrop and the *Eleocharis tuberosus* which are fertilized with night soil and raised in shallow water ponds in which fresh water snails congregate. Drying the plant kills the cyst. On an average about 17 cysts have been found on the " nut " of the caltrop, but as many as 200 have been counted on a single nut. Pigs were successfully infected, although natural infection has not been recorded locally. The parasites so obtained were smaller than those raised in a human case.

R. T. L.

KOBAYASHI (Harujiro). **Lung-Fluke Disease in Chosen.**—*Mitt. d. Med. Akad. zu Keijo.* 1926. Vol. 9. No. 3 & 4. 3 pp. With 1 map.

Kobayashi regards paragonimiasis as the most important parasitic disease in Korea. In 1923–4 the Government conducted a survey in those regions in which the infection was known to be most prevalent and found that 7·9 per cent. of the 353,729 Koreans and 0·7 per cent. of the 1,816 Japanese recorded in the survey were infected. The whole of the North Kankyo-Do and the northern half of South Kankyo-Do appear to be free. The molluscan intermediary belongs to the genus *Melania.* The species of Melania known to occur in Korea total about a dozen. The second intermediary in Korea is either the freshwater crab *Eriocheir sinensis* or the crayfish *Cambaroides similis.* The distribution of lung fluke disease in Korea is plotted on a text map in the article. The Koreans are very fond of crabs which they often eat uncooked while they take the raw juice of crayfish as a medicine for fever or diarrhoea. Official steps are being taken to prevent

infection, viz.: (*a*) Propaganda by pamphlets, posters and kinematograph; (*b*) Legal prohibition of fishing for crabs and crayfish. Official treatment consists in emetine injections. Many patients recover and this treatment is considered to be a very satisfactory one.

R. T. L.

KOBAYASHI (Harujiro). **On the Final and Intermediate Hosts of Lung-Fluke in Chosen.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 413–417. With 3 charts.

Kobayashi records *Paragonimus westermanii* from the following wild mammals in Korea: Tiger, panther (very common), fox, wolf, and wild cat. There are ten species of *Melania* in Korea. Of these, five (*M. libertina, M. paucicincta, M. extensa, M. gotschei,* and *M. nodiperda*) have been previously proved to be intermediate hosts; the remainder he assumes to be intermediate hosts as they are the only species of this genus found in endemic areas (*M. libertina* var. *hidachiensis, M. multicincta* and three unknown species). The genus is absent from the northern part of Korea, possibly on account of the low winter temperature. As the second hosts are found throughout the province, the distribution of Melania determines the distribution of the fluke. The second intermediate hosts are *Eriocheir sinensis* (which is found throughout Korea) and two species of crayfish, *Cambaroides similis* (which occurs throughout except in the north) and *Cambaroides* sp. (which replaces the other in the north). *Sesarma dehaani* has been found in Korea; although it is a known host in Japan, no larvae have been found in this crab in Korea.

T. W. M. C.

ANDO (Akira). **Supplement to the Studies on the Development of Lung-Fluke.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress Tokyo, 1925.* Vol. 1. p. 419.

This very brief abstract gives no information beyond the fact that there appears to be a very close relationship between the lung fluke and the presence of oxygen.

T. W. M. C.

FAUST (Ernest Carroll). **The Epidemiology of Clonorchis Infection in China.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 397–403. With 1 map in text. [19 refs.]

Clonorchis sinensis does not occur endemically in man in Northern China, although dogs and cats are naturally infected. In central China, it is occasionally found in man; dogs and cats, however, are heavily infected. The fluke is common in human beings in south China, especially in the Canton and Swatow areas; the infection of the reservoir hosts in this area is light. In the Canton district, hospital examinations show a 25 per cent. infection, but in some areas it may rise to 100 per cent. In the Swatow district also, infection is very heavy.

Bythinia striatula is found throughout China, its frequence corresponding with the frequence of the fluke. It is, however, absent from north-western China. Faust's studies show that not only were all

examples of the Cyprinidae examined infected, but that species of the Gobiidae and of the Anabantidae may also harbour the metacercaria. The principal hosts in north and central China (as in Japan and Korea) are *Pseudogobio altivelis*, *Hemiculter kneri*, and *Pseudorasbora parva* all small species. In south China, the principal carriers are larger species—*Ctenopharyngodon idellus*, *Parambristis* sp., and *Labeo jordani*. Raw fish is only consumed among the Cantonese and Swatowese, and most infections are from eating raw fish; the remainder, however, come from eating fish insufficiently cooked (dipping for a few seconds in boiling water, etc.) or dried or salted fish. Elsewhere raw fish is not eaten: if it were, infection would be much higher. The disease could easily be eradicated within a generation by educating the population as to the dangers of eating raw or partly cooked fish.

T. W. M. C.

NAGANO (Kanji). **Studies on the Problems of** *Clonorchis sinensis.* – *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 379–385.

From the results of his experiments, Nagano concludes that the egg of Clonorchis does not normally hatch in the water but must be ingested by the snail before the miracidium can escape. The sporocyst is an irregular oval (·354 mm. by ·171 mm.). The redia is active and is able to migrate to the liver after escaping from the sporocysts. The cercaria has a pair of pigmented eye-spots, four ducts on the dorsal side of the oral sucker, and is rich in a yellow brown pigment; the digestive system on this account cannot be seen. At rest, the tail is held upwards. The free life of the cercaria does not exceed 50 hours. It creeps along under the skin of the fish, losing its tail as it does so, and is almost encysted within 5–6 hours. It is completely encysted within 24 hours. The oral sucker, eye spots, and excretory vesicle are still visible. After 8 days, the cyst commences to enlarge slightly, and by 52 days it has become oval in shape and the eye-spots have mostly disappeared, the pigment has become darker and is reduced in quantity, and the digestive system is now visible. Active metacercaria may be recovered from the water in which fish have decomposed, the majority being found within 2–4 days after death. The author considers that human infection is thus possible from drinking water. Bythinia is commonest on low-lying, stagnant ground. It can be destroyed in 24 hours with a ·2 per cent. mixture of "lime-nitrogen" which also destroys the 2nd intermediate host, but is not poisonous to mammals. Dredging and drying of canal mud are recommended as prophylactic factors.

T. W. M. C.

KHAW (O. K.). **Studies on the Egg-Miracidium Stage of the Life-History of** *Clonorchis sinensis* **(Cobbold) 1875.** *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 387–396. [13 refs.]

The egg of *Clonorchis sinensis* is fertilized in the "Oötype," and at the same time the shell is provided. Development continues as the egg passes down the coils of the uterus and by the time it has reached the bile it is mature. Khaw estimates that one adult (in the guineapig) deposits 1,600 eggs daily. The egg has a specific gravity of over

1·2, and there is a protective membrane protecting the miracidium which is more or less impermeable. The embryo will live, in its shell, for 3 months on ice (2°–4° C.), 6 months at 4°–8° C., 3–4 weeks at 26° C., 3 weeks at 37° C., and one hour at 50° C. It is immediately killed by drying, while in old night soil (at room temperature) it only survives for two days. It is destroyed in 5 days in 1 per cent. NaCN, and in 5 minutes in ·001 per cent. corrosive and ·025 per cent. of a concentrated solution of bleaching powder. Temperature appears to have little effect on the hatching of the embryo, although rapid changes in temperature, mechanical pressure, or changes in tonicity may cause the miracidium to emerge.

T. W. M. C.

ITO (Kuwataro). **Biological Studies on the Cercaria of the** *Clonorchis sinensis.*]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1926. Mar. Vol. 33. No. 2. [Summarized in *Japan Med. World.* 1926. Oct. 15. Vol. 6. No. 10. p. 289.]

The percentage infection of Bythinia varies according to the season. Temperature assists the freeing of the cercaria (optimum 27 -31° C.), low temperature inhibiting their liberation. Light and nature of water does not affect this. Cercariae swarm at the bottom of the water, moving briskly with a "jumping" movement. Their maximum free life is about 30 hours in water, 3 minutes in ·3 per cent. hydrochloric acid, and 3 hours in 1 per cent. sodium bichlorate. Normal serum and serum from infected animals have the same effect on the larvae which move briskly in 1 : 3 serum.

T. W. M. C.

FAUST (Ernest Carroll) & KE-FANG (Yao). **Specific Therapeusis in Clonorchis Infections.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 383–391. With 4 text figs. [7 refs.]

Faust and Ke-Fang used mercurochrome, gentian violet, tartar emetic, emetine and carbon tetrachloride in attempts to find a drug with a definite clonorchicidal value. The drugs were given orally or intravenously to experimental animals which were ultimately killed. The most potent in this series was gentian violet—orally, it destroyed 50–100 per cent., and intravenously 36–61 per cent. of the flukes. Tartar emetic intravenously destroyed 31–45 per cent. while the others had no effect. Mercurochrome and gentian violet both caused a marked reduction in egg production, which was preceded by hyperproduction; the former drug has no effect on the flukes.

T. W. M. C.

KUWATARO. [**On the Distribution of the Worm in the Liver of the Rabbit suffering from Experimental Distomiasis.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*) 1925. Nov. Vol. 32. No. 6. [Summarized in *Japan Med. World.* 1926. Apr. 15. Vol. 6. No. 4. p. 90.]

In 21 rabbits experimentally infected with *Clonorchis sinensis* the flukes were found to be situated peripherally in the liver immediately after death, but later they migrated to deeper portions.

T. W. M. C.

YAMAZAKI (S.). Beiträge zur Symptomatologie und Therapie der Distomiasis. [**Symptomatology and Treatment of Distome Infestation.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. Feb. No. 251. German summary p. 4. [In Japanese.]

From a systematic faecal examination, 56 cases of distomiasis were diagnosed and the author finds that 20·3 per cent. showed enlargement of the liver, 10 per cent. anaemia, 10 per cent. diarrhoea, 6·8 per cent. oedema, 11·7 per cent. colic, 8·4 per cent. gastro-intestinal disturbances. and 8·4 per cent. asthenopia.

T. W. M. C.

VAN THIEL (P. H.). Beiträge zur Kenntnis der Trematoden aus *Anopheles maculipennis* Meig. [**The Trematodes from** *A. maculipennis.*]—*Beikefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1925. Vol. 29. No. 1. pp. 396–400. [8 refs.]

Van Thiel gives grounds for believing that the encysted trematode larvae so commonly found in *Anopheles maculipennis* belong to the genus *Pneumonoeces*, several species of which live in the lungs of frogs.

R. T. L.

OZAKI (Yoshimasa) & ASADA (Junichi). **A New Human Trematode,** *Heterophyes katsuradai* **n.sp.**—*Jl. Parasit.* 1926. June. Vol. 12. No. 4. pp. 216–218. With 1 plate. [6 refs.]

—— & ——. [**On a New Species of Katsurada's Heterophyes Family of Parasites found in a Human Case.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1925. Nov. No. 2445. [Summarized in *Japan Med. World*. 1926. Feb. 15. Vol. 6. No. 2. p. 42.]

ASADA (Junichi). Eine neue Art Trematode des Menschen: "*Heterophyes katsuradai.*"—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 360–365. With 4 text figs.

Under the name of *Heterophyes katsuradai*, Osaki and Asada describe what they believe to be a new species of intestinal fluke from human beings in Japan. They distinguish this form from the other members of the genus by the large size of the ventral sucker, and the distribution of the yolk glands which cross the dorsal median line to unite with each other at the anterior border of the testes. The flukes were recovered after treatment with thymol. The first intermediate host is unknown, but the second intermediary is the "Bora" (*Mugil cephalus*) and the parasite has been experimentally transmitted to the dog by feeding with the flesh of infected fish. It appears to be fairly widely distributed throughout Japan.

T. W. M. C.

ANDO (Ryo) & TSUYUKI (Kae). [**On** *Echinostoma Gotoi* (**Ando-Ozaki's New Trematode**) **which has the Intermediate Host in Paludina.**]—*Iji Shimbun* (*Med. News*). 1926. June. No. 1190. [Summarized in *Japan Med. World*. 1926. Oct. 15. Vol. 6. No. 10. p. 285.]

The intermediate host of *E. gotoi* are two species of Vivipara. Feeding these snails to young rats produced the adults, and the authors suggest that, as these snails are eaten by the inhabitants, there may be a possibility of human infection.

T. W. M. C.

COLEMAN (Robert B.). **Egyptian Splenomegaly, and its Relation to Schistosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. June 17. Vol. 20. No. 3. pp. 224–227. [8 refs.]

Coleman concludes that Egyptian splenomegaly is a special feature of *S. mansoni* infection, as had been previously stated by DAY (1924). The two diseases have the same limited geographical distribution, i.e., irrigation districts where end-canals are common. Microscopical examination of spleens in splenomegaly always shows the presence of the eggs of *S. mansoni*. He points out that cases of rectal schistosomiasis are by no means invariably caused by *S. mansoni*: cases from south of Cairo are always caused by *S. haematobium*. Antimony treatment is attended with good results in early cases, while splenectomy is certainly beneficial.

R. T. L.

KHALIL (M.). **The Bearing of Agricultural Schemes in the Nile Valley on Bilharziasis as observed at Kom Ombo Company Estate.**—*Jl. State Med.* 1926. Aug. Vol. 34. No. 8. pp. 472–477.

Khalil finds that Kom Ombo in Upper Egypt is a focus of *Schistosoma haematobium* infection. From a systematic examination of the urine, over 80 per cent. of the children were found to be infected, less in those born outside the village and in the better class of children, especially the girls. Infection is due mainly to the use of unfiltered and unstored water. *S. mansoni* is absent, but Ancylostoma, Ascaris and Hymenolepis are present. *Bullinus dybowski* and other species of the same genus were found, but Planorbis was absent. How the snails reached the village is unknown. Treatment will be undertaken, and methods of exterminating the snails are under consideration.

T. W. M. C.

CAWSTON (F. G.). **The Bilharzia Problem in South Africa.**—*Jl. Trop. Med. & Hyg.* 1926. June 15. Vol. 29. No. 12. pp. 177–179. With 4 text figs.

Cawston has found cercariae resembling those of Schistosoma in South Africa only twice in species of *Isidora*, other than *I. africana*: *I. tropica*, however, is heavily infected with amphistome cercariae. He points out that the mere presence of *I. africana* must be regarded as a risk of infection as they may be infected by carriers of Schistosoma. The solution of the problem of South Africa bilharziasis depends partly at least on education.

T. W. M. C.

CHANDLER (Asa C.). **A New Schistosome Infection of Man, with Notes on other Human Fluke Infections in India.**—*Indian Jl. Med. Res.* 1926. July. Vol. 14. No. 1. pp. 179–183. With 3 figs. on 1 plate. [6 refs.]

In two apparently human stools collected in northern Bengal, from two villages where, however, pigs and goats were also common, Chandler has found eggs of an unknown trematode. To these he gives the name of *Schistosoma incognitum*. The egg is characterized by a slightly laterally directed spine and measures about 90–100μ by 45–50μ, the spine being 8μ long. Chandler also records that *Fasciolopsis buski*

is common in Bengal pigs slaughtered in Calcutta, and that it is frequently accompanied by *Gastrodiscoides hominis*. Of 26 stools examined from a village in eastern Bengal, three from children between 8 and 10 years old were found to contain eggs of *F. buski*. No case of infection of man with *G. hominis*, Opisthorchis, Clonorchis, or Heterophyes has yet come under the author's notice in the course of his work in India, although *O. felineus* is very common in cats in Calcutta.

R. T. L.

FAIRLEY (N. Hamilton) & MACKIE (F. P.). **A Preliminary Report on the Pathology of** *Schistosomum spindalis.*—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 423–446. [15 refs.]

Schistosoma spindalis was found by MONTGOMERY in 1906 in *Bos indicus* and LISTON and SOPARKAR in 1918 discovered that its intermediate host is *Planorbis exustus* and goats were experimentally infected. In the present paper, Fairley and Mackie state that 4 per cent. of the goats in Bombay are naturally infected. Recently they have been able to infect the buffalo which they consider is the natural host. They were unsuccessful however in infecting *Macacus sinicus*.

The macroscopic appearances of a typical autopsy are the antemortem thrombosis in the portal or mesenteric veins and its branches, and changes in the liver varying from the early bilharzial pseudotubercles to a pipe-stem periportal cirrhosis. The microscopical changes are described in detail. This species is most closely related to *S. mansoni* and *S. japonicum* in habit, and so the liver is generally involved (whereas *S. haematobium* living in the pelvic plexus, which has a venous connection with the lungs, causes that organ to be frequently involved). In *S. mansoni*, verminous thrombosis is rare, while in *S. japonicum* and *S. spindalis* infections this is common. The spleen, unlike in the two human diseases, is seldom involved and bilharzial papillomatosis is not observed owing to the non-irritating character of the ova; this explains also the absence of local necrosis and inflammation around the areas of egg deposition observed with *S. japonicum*.

T. W. M. C.

FAIRLEY (N. Hamilton). **The Serological Diagnosis of** *Schistosomum spindalis.* (**Cercarial Antigen.**)—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 372–382. With 1 text fig. [7 refs.]

Infected livers of *Planorbis exustus* are teased with needles and 1 cc. of absolute alcohol added to each. They are shaken for 20 minutes and extracted for 24 hours at 37 C, filtered and concentrated in a water bath at 45 C., by bubbling air through until turbid. Alcohol is added until clear and the material is then put up in 1 cc. ampoules and stored in the ice chest until required. For routine work, it is used with the addition of 39 parts of saline. This cercarial extract is strongly antigenic and will detect human schistosomes, as well as *S. spindalis* and *S. indicum* in goats. By testing various alcoholic extracts of furcocercous cercaria against a known bilharzial serum, it is possible to state whether the cercaria is a schistosome or not. All his experimental goats developed a positive reaction within seven weeks of infection—the time of appearance depending on the heaviness of the

infection—and the reaction persists as long as the animal harbours living schistosomes. Pleural and peritoneal transudates and exudates yield positive reactions, but not the cerebrospinal fluid. A pseudo-positive reaction only occurred on one occasion, although all the animals had intestinal parasites and many had cysticerci. In this case a Fasciola infection might have been overlooked, and this is a possible fallacy. 24 out of 26 human *S. haematobium* infections reacted to the *spindalis* antigen; but owing to the lipoid nature of the antigen, it is necessary to eliminate pseudopositive reactions in syphilitic sera. The antigen should only be prepared from heavily infected livers, the alcoholic extract should be evaporated and emulsified in saline; and the serum should be examined within 24 hours.

R. T. L.

FAIRLEY (N. Hamilton). **Studies in the Chemotherapy and Immunity Reactions of Schistosomiasis.** (*Schistosoma spindalis* **and** *Schistosoma haematobium.*)—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Nov. 25. Vol. 20. No. 4. pp. 236–267. [87 refs.]

Working with *S. spindalis* of goats, Fairley finds that intravenous injections of alcohol-soluble extracts of the cercaria cause a marked increase in antibody content of the serum but do not modify the course of the disease. He also finds that the efficacy of tartar emetic and emetine is enhanced by the addition of small quantities of human serum. Tartar emetic cured 13 out of 22 animals when given on alternate days and 6 out of 7 when the injections were more frequent. He considers that 16–26 daily injections of 3·9–5·5 mgm. per kilo body weight will cure *S. spindalis* infection in goats. The drug is especially lethal to female worms and appears to have an inhibiting effect on egg production. Intravenous injections of emetine cured 8 out of 8 goats and subcutaneous injections 3 out of 4. It is as efficient but more toxic than tartar emetic. 45 animals were used in his experiments and all developed positive complement fixation reactions, but this disappeared in one to four months after treatment had commenced. He finds that in some clinically cured cases of *S. haematobium* infection positive reactions could be obtained a year later and suggests that this may be due to the survival of a limited number of males or too few females to produce symptoms.

R. T. L.

TURNER (A. W.). **Complement Fixation with Bilharzia: the Failure to produce Anaphylaxis with the Cercarial Extract used in the Test for Mammalian Bilharziosis.**—*Jl. Path. & Bact.* 1926. July. Vol. 29. No. 3. p. 307. [3 refs.]

Turner has tested the alcoholic extracts of cercaria used as antigen in the Bilharzia test and concludes that protein, if present at all, occurs in such minute quantities as to be undetectable; i.e., to all intents and purposes there is no protein concerned in the Fairley reaction.

T. W. M. C.

CHENG FANG TSU. Ueber den acuten Milztumor bei *Schistosomiasis japonica.* [**The Acute Spleen Tumour in** *S. japonicum* **Infection.**] — *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 465–466.

In a rabbit of 2,400–2,850 gm. infected with 600–800 cercariae of *Schistosoma japonicum*, the spleen increases in weight from ·9–1·3 gm. to as much as 6 gm., and becomes dark red in colour. In acute schistosomiasis, at least when due to massive infection, a typical "spleen tumour" is formed, not through venous stenosis, but from an acute splenitis possibly from the excretion or secretion of the parasites in the portal system.

T. W. M. C.

REISINGER (E.). [I. Untersuchungen ueber Bau und Funktion des Excretionsapparats digenetischer Trematoden.] [**Structure and Function of the Excretory Apparatus of Digenetic Trematodes.**]—*Zool. Anz.* 1923. June 29. Vol. 57. Nos. 1–2. pp. 1–21. [Summarized in *Bull. Inst. Pasteur.* 1926. Apr. 15. Vol. 24. No. 7. p. 323.]

This is a histological and anatomical study of the miracidium of *Schistosoma haematobium*, special attention being paid to the excretory system.

T. W. M. C.

TOOTELL (G. T.). **The Comparative Treatment with Mercurochrome 220 Soluble and Tartar Emetic in Schistosomiasis Japonica.**—*China Med. Jl.* 1926. May. Vol. 40. No. 5. pp. 440–448. [1 ref.]

The clinical records are given of eight in-patients suffering from Schistosomiasis japonica who were treated with mercurochrome 220 soluble. The dosage was computed on a basis of 2½ cc. of a one per cent. solution for every eleven pounds of body weight.

The author was led to try this drug, which has been used for malaria, in the hope that the duration of the treatment might be shortened and that the inoculations might be less painful. He concludes from his present experience that it is the drug of choice for patients in the early and uncomplicated stages of the disease and where the haemoglobin count is 70 per cent. or over. Where the disease is of long standing and the patient has low resistance it is better to give tartar emetic in increasing doses with iron and arsenic as tonics.

Although patients leave hospital cured, there is little hope that after they return to their homes they can avoid re-infection.

R. T. L.

FRANÇA (Carlos). Quelques considérations sur le traitement de la bilharziose par l'émétique. [**Treatment of Bilharziasis by Tartar Emetic.**]—*Revista Méd. de Angola.* (No. especial le Congresso de Med. Trop. da Africa Ocidental. Vol. 3, 3a, 4a e 5a Sessões.) 1923. Aug. No. 4. pp. 149–153.

França believes that undoubtedly the best treatment for bilharziasis is tartar emetic as used by CHRISTOPHERSON and he has studied the altered eggs in urine after the use of this drug. Such eggs may

have a normal outline, but with a structureless embryo; or be very small (77–101μ), yellowish and granular; or shrivelled—which have developed completely but have been subsequently killed by the salt. He believes that the small granular eggs are immature and prematurely deposited and suggests that, after treatment, the measurement of the eggs passed is an index to the effectiveness of the drug.

R. T. L.

FRANÇA (Carlos). A ovometria nas schistosomoses. [**Measurement of Ova in Schistosomiasis.**]—8 pp. [3 refs.] [n.d., n.p.]

After treatment with tartar emetic, the bilharzia ova passed by the patient are smaller and granular. The author believes that the drug has procured abortion in the schistosomes and that these ova are passed before completing their development. Ovometry is therefore believed to be a useful indicator of the success of treatment of *S. haematobium*. In *S. mansoni* infection, however, the ova disappear suddenly, the females containing only one or two ova and in these infections disappearance is complete.

R. T. L.

GORDON (R. M.) **Emetine Periodide in the Treatment of** *S. haematobium* **Infections amongst West African Children.**—*Ann. Trop. Med. & Parasit.* 1926. Aug. 13. Vol. 20. No. 3. pp. 229–237. [8 refs.]

Antimony, although used since 1915 in the treatment of schistosomiasis, has always been employed as an injection, and in an attempt to find a preparation which, as suggested by LEIPER in 1925, could be given orally, Gordon has treated a series of cases with emetine periodide. Twenty-eight West African children suffering from severe *Schistosoma haematobium* infection were selected and divided into two groups of 14 each. One group received subcutaneous doses of emetine hydrochloride ($\frac{1}{2}$ grain daily for 15 days) while the other was given, by mouth, thrice daily for 15 days, one grain of powdered emetine periodide mixed with milk. No unpleasant effects followed this treatment. After 8 days, all the first group and twelve of the second group has ceased to pass live ova and the remaining two passed a mixture of dead and live eggs.

T. W. M. C.

TANABE (Bunshiro). **The Differentiation between the Seventeen Species of Schistosome and their Geographical Distribution in the World.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 449–463. With 1 map. [8 refs.]

This is a series of tables showing the differences between the 17 known members of the family Schistosomidae, including the 8 known species of Schistosoma.

T. W. M. C.

LEVY (David J.) & PIERSON (Merle). **Native Infestation by the Fish Tapeworm,** *Diphyllobothrium latum.* **Report of a Case in Detroit.**—*Jl. Amer. Med. Assoc.* 1926. Sept. 11. Vol. 87. No. 11. p. 848. [2 refs.]

Levy and Pierson report a case of an American born girl who has always lived at Detroit and who suffered from cramplike abdominal pains. She was found to be harbouring a specimen of *Diphyllobothrium latum.* On treatment with aspidium, the worm was passed and the pain disappeared.

R. T. L.

SCHMIDT (Harry B.). **A Simple Method for finding** *Dibothryocephalus latus* **Eggs in the Stools.**—*Jl. Lab. & Clin. Med.* 1926. June. Vol. 11. No. 9. p. 891.

The stool is mixed with a little saline, centrifuged and a drop of the sediment and the supernatant fluid examined on a slide, the coverslip being pressed down firmly to displace the operculum. It is often unnecessary to centrifuge the stool.

T. W. M. C.

ANDO (Akira). **Considerations relating to the History of the Development of** *Sparganum mansoni*, **especially of its** *Dibothriocephalus decipiens.*—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 421–422.

Feeding experiments with *Sparganum mansoni* from man, cat, fowl and frog proved that these would develop into adult tapeworms in the dog and cat. The sparganum can be harboured by the monkey, pig, rabbit, guineapig, rat, mouse, hen, pigeon and frog, but not the carp. In some villages in Japan, as many as 95 per cent. of the cats and 20 per cent. of the dogs were infected with the adult.

[This paper appears to be only a short summary. The author refers to the adult tapeworm, resulting from feeding with *Sparganum mansoni*, as *Dibothriocephalus decipiens*, but no reasons are given as to why this is done.]

T. W. M. C.

BACIGALUPO (Juan). *Hymenolepis diminuta*: **su evolución.** [*Hymenolepis diminuta*: **its Evolution.**]—*Semana Méd.* 1926. Jan. 14. Vol. 33. No. 2. (1670). pp. 67–69. With 7 text figs.

Hymenolepis diminuta has been recorded by Professor GREENWAY from two children in Argentina, the first in 1904—a girl of 8 years arriving from Italy. After having been four months in the country, she had epileptiform fits. The second case was a boy of 18 months, an Argentine, who had not left his country, and arrived at some hospital in the province of Buenos Aires.

An examination of 300 rats showed that 28 per cent. of these were infected. The author studied the developmental stages of the parasite in *Tenebrio molitor* and illustrates them by 4 microphotographs.

R. T. L.

ROTH (E. J. H.). **Man as the Intermediate Host of the** *Taenia solium.* —*Brit. Med. Jl.* 1926. Sept. 11. pp. 470–471. With 1 plate.

Roth reports a case of a man who had suffered from "rheumatic" pains in the left knee joint for some five years and who had epileptiform "fits" at about monthly intervals for the past ten years. Some remarkable radiograms were obtained. These are reproduced and shew the presence of calcified cysts in various parts of the body. One cyst was removed under a local anaesthetic and proved to be *C. cellulosae.* The infection was probably contracted in India. There is no history of any intestinal tapeworm.

R. T. L.

DEW (Harold R.). **Observations on Hydatid Disease in the Domestic Herbivora** (*Echinococcus multilocularis*) **and its Relationship with** *Echinococcus alveolaris.*—*Med. Jl. Australia.* 1926. Sept. 4. 13th Year. Vol. 2. No. 10. pp. 301–309. With 8 figs. on 1 plate. [21 refs.]

Dew finds that about 40 per cent. of all sheep slaughtered at Melbourne harbour hydatid cysts, but in some regions the incidence is as high as 75 per cent. Cattle are much less frequently infested—the incidence being about 30 per cent. and the cysts are often sterile and degenerate. The sheep must be regarded as the most important intermediate host. The nomenclature of the various forms of hydatid cyst is very varied. Dew recognized the three following conditions:

(1) *Echinococcus polymorphus,* the unilocular or pouched form found typically in man.

(2) *Echinococcus multilocularis,* typical of the ox.

(3) *Echinococcus alveolaris,* a rare human form of limited distribution.

In sheep, the lungs and liver are most frequently infected (52 per cent. and 42 per cent. respectively) and the cysts are usually of a simple or pouched multilocular form, but occasionally a multicystic form similar to the bovine is seen. In cattle the lungs also are more frequently affected than the liver (69 per cent. and 27 per cent. respectively). Simple cysts are rare and the usual form seen is a typical multicystic variety consisting of congeries of small cysts separated from each other by fibrous adventitial septae, the cells of which are arranged in a peculiar trizonal arrangement. The cysts are invariably sterile.

Human alveolar hydatid is then considered (on the basis of DÉVÉ's work, as this variety is not found in Australia) and Dew considers that these three main types may be explained by considering them as interruptions at various stages of the parasite's life history.

(1) The embryo grows rapidly and actively and causes toxic changes in the surrounding tissue which are manifested by necrosis of the cells. If for some reason this is exaggerated, the result would be the production of a typical alveolar hydatid. The parasite would extend peripherally while centrally there would be cutical production owing to the action of the antibodies. Lack of food material in the centre of the parasite would ultimately cause the typical central necrosis.

(2) The second stage is the follicular stage in which the cellular reaction of the adventitial tissue assumes a trizonal form and the parasite elaborates its fluid and its cuticle. If this stage is reached

and persists, the picture is that of the bovine form. The persistent cellular reaction of the host seems to inhibit the ideal development of the parasite and so accounts for its sterility.

(3) If the parasite has settled in a fertile soil, the third or final stage is reached with the production of a more or less spherical fertile cyst and a perfect balance between parasite and host. If for some subsequent reason the vitality of the parasite is affected, it dies or produces endogenous daughter cysts.

T. W. M. C.

MÜNNICH (G.). Zur Kasuistik des chirurgischen Echinokokkus. [**Symptoms of Surgical Echinococcus.** — *Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 220–226.

Symptoms are generally lacking in early stages of hydatid disease —but damage of the cyst membrane causes eosinophilia and antibody production. Local symptoms followed by eosinophilia and a positive Weinberg test then make diagnosis fairly certain.

Successful use is being made of X-rays for localization of cysts in lung and liver cases and for the differential diagnosis of dermoid cyst and lung sarcoma and is also being tried as treatment for inoperable cases and before operation. DEVÉ proposed sterilization of cyst contents before operation by injection of 1 per cent. formalin, and this lessens the danger of anaphylaxis. FUROCHETTO's method of aspiration is largely used in South America. The sac could be totally removed or, where this was impossible, marsupialized, but many surgeons now used modifications of Posadas method (by which the sac was first closed without draining) in preference to marsupialization which is apt to have serious after effects.

In conclusion, two cases recently operated upon are described.

R. T. L.

DUHOT (E.), CRAMPON (P.) & LEFÈVRE (J.). Sur la production d'anticorps spécifiques par injections expérimentales de liquide hydatique. [**Production of Specific Antibodies by Experimental Injection of Hydatid Fluid.**] — *Ann. Parasit. Humaine et Comparée.* 1926. July 1. Vol. 4. No. 3. pp. 232–235. [1 ref.]

The authors have injected filtered hydatid fluid into rabbits and find that specific antibodies are produced. Owing to the variations in the antigenic power of hydatid fluid in the Weinberg reaction, they suggest that an experimentally prepared antiserum would be of use in controlling the reaction in the diagnosis of the condition in man.

T. W. M. C.

CAMERON (G. R.). **A Note on the Enzymes of the Hydatid Cyst.** — *Australian Jl. Experim. Biol. & Med. Sci.* 1926. Mar. 16. Vol. 3. Pt. 1. pp. 11–14. [6 refs.]

Cameron finds that the chief enzymes in the hydatid cyst wall are diastatic, but that there are present, in addition, a proteolytic enzyme coagulating milk, a trace of a lipase, a protease and oxidases. With the exception of the trace of lipase, there are no enzymes in the fluid.

T. W. M. C.

LEMAIRE (G.). Recherches sur la perméabilité des kystes hydatiques et sur la nature du poison hydatique. [**The Permeability of Hydatid Cysts and the Nature of the Hydatid Toxin.**]—*Presse Méd.* 1926. Sept. 18. Vol. 34. No. 75. pp. 1187–1188. [1 ref.]

In addition to an examination of the blood elements, the following tests are used in the diagnosis of hydatid. (1) Weinberg's reaction; (2) Gleig and Lisbonne's or the precipito-diagnostic reaction; and (3) the Casoni or intradermal reaction. Considering the first two together, it is found that they give a positive result in about 20 per cent. of cases. Even Lemaire's own results are 4 positives out of 24 verified cases. Casoni's reaction, on the other hand, gives much higher figures and he has obtained 21 positives out of 24 cases—16 having apparently sterile hydatids. He considers that these results do not agree with the theory of the impermeability of the cyst wall and that the high percentage of successful results in the Casoni reaction indicates that there is a filterable toxin with a special selectivity for the skin. The nature of this toxin is unknown. More constant results in diagnosis would be obtained by using a dialysed hydatid fluid, since where peptone bouillon is used as the vehicle for the toxin, non-hydatid cases sometimes react positively.

T. W. M. C.

LEMAIRE & THIODET. Sur la nature du poison hydatique. [**The Nature of Hydatid Toxin.**]—*C. R. Soc. Biol.* 1926. June 25. Vol. 95. No. 22. pp. 166–168.

The authors report 90 per cent. of successful results in the use of the Casoni reaction for hydatid. They draw attention to three cases in which, although hydatid was absent, a positive result was obtained—the patients suffered from cancer of the liver, amoebic abscess of the lung, and pleuro-pulmonary tuberculosis. In the two last a reaction similar to Casoni's was obtained by the use of peptone broth. Dialysed hydatid fluid, however, removes this source of error, and they suggest the routine use of such a liquid in practice.

T. W. M. C.

ANDERSON (C. C.). **X-Ray Diagnosis of Hydatid Infection.**—*New Zealand Med. Jl.* 1926. Aug. Vol. 25. No. 128. pp. 203–208. With 2 figs. [3 refs.]

Anderson considers that X-rays are useful in diagnosing hydatid infection in bones and ligaments and that the demonstration of circular, ovoid, or elliptical shadows in patients who have lived in sheep rearing countries or been in contact with domestic animals, especially dogs, is very suggestive of this disease. In other situations X-rays should be supplemented by other methods.

T. W. M. C.

STRACHAN (A. S.). *Cysticercus cellulosae* **of the Brain.** [Notes on Cases.]—*Med. Jl. S. Africa.* 1926. Aug. Vol. 22. No. 1. p. 13.

Dr. Strachan records a case of a male native (56 years old) who had suffered from delirium, whose meninges were studded with numerous

Cysticercus cellulosae and whose brain substance was also riddled with the cysts. No adults were found. He reports a second case of a native (60 years old) who had died of arteriosclerosis and who had a single Cysticercus embedded in the wall of the right ventricle of the heart.

R. T. L.

PRIEST (Robert). **A Case of Extensive Somatic Dissemination of *Cysticercus cellulosae* in Man.**—*Brit. Med. Jl.* 1926. Sept. 11. pp. 471–472. With 1 text fig.

Priest reports a case of *C. cellulosae* in a man, aged 24. The cysts were localized in various parts of the body and nearly all the muscles were enlarged. There was a history of abdominal pain, vomiting, and fever. Two excised cysts proved to be *C. cellulosae*.

R. T. L.

KLEIN (B.). Die Duodenalsonde in Verwendung bei Bandwurmabtreibungskuren. [**The Duodenal Sound in Tape Worm Treatment.**] —*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. June 1. Vol. 30. No. 6. pp. 250–251.

Klein has studied the value of treating tapeworm infections by means of Einhorn's duodenal sound. 65 cc. of a macerated preparation of Cort. granat. was introduced at body temperature to fasting patients three times at half-hourly intervals; and 80 cc. of Aqua laxativa Viennensis through the same sound half-an-hour later. An aperient was given. This method was successful in 17 out of 19 cases treated, twelve of which were *Taenia saginata*, four *T. solium*, and one *Hymenolepis nana*. Complete worms were expelled in 12 of the Taenia cases, and in 4 they were headless, but the heads were found in the faeces. The Hymenolepis worm was not found nor were eggs met with in the faeces during two years' observation. The sound could be used for other more resistant helminthic infections, and to reinforce therapeutic action.

R. T. L.

ISOBE (M.). **Physico-Chemical Conditions and Pharmacological Studies on the Movement of the Hexacanth Embryo.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. p. 1091.

[This article appears to be a summary.] Isobe believes that the only function of the hooks in the hexacanth larva of the cestodes is to enable it to escape from its shell. He states that quinine, chloral hydrate, alcohol, etc. "in a given concentration" have an inhibitory action on the movement of the larva.

T. W. M. C.

i. LLAMBIAS (J.). Altérations de la membrane hydatique. [**Changes in the Hydatid Membrane.**]—*C.R. Soc. Biol.* 1926. Dec. 3. Vol. 95. No. 35. p. 1381.

ii. BRUMPT (Emile). Enkystement d'un anneau de *Dipylidium caninum* (L.) dans la paroi du gros intestin d'un jeune chat dysenterique. [**Encystment of Segment of** *D. caninum* **in the Wall of the Large Intestine of a Cat.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 365–368. With 2 text figs. [4 refs.]

iii. KOBORI (Kohtaro). **Contribution to the Study of** *Hymenolepis diminuta*. **Communication II. Does this Parasite need Intermediate Host? On the Resistance of the Eggs.** *Aichi Igakkwai Zasshi (J. Aichi Med. Soc.).* 1925. Sept. Vol. 32. No. 5. [Summarized in *Japan Med. World.* 1926. Apr. 15. Vol. 6. No. 4. pp. 89–90.

i. Llambias records two cases of a peculiar abnormality in hydatid cysts which appears to be a hypertrophy with malformation limited exclusively to the cuticular layer.

ii. Brumpt records the finding of a segment of *D. caninum* encysted in the wall of the large intestine of a cat.

iii. Kobori finds that *H. diminuta* will not develop without an intermediate host, and that the egg is fairly resistant to chemical and physical changes.

T. W. M. C.

SANDGROUND (J. H.). **Some Observations on the Life-Cycle, Methods of Diagnosis and Incidence of** *Strongyloides stercoralis* **in the Tropics.** *Fourteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass. 1925.* pp. 240–245. [8 refs.]

——. **Some Biological Studies on the Life-Cycle in the Genus Strongyloides.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 528–533. [14 refs.]

LEICHTENSTERN had suggested that the two distinct types of life cycle observed in Strongyloides were due to the existence of two varieties, one prevalent in the tropics, showing the indirect cycle and the other found in temperate climates, showing the direct one. DARLING's work, supplemented by the author's own, made this explanation doubtful, possibly because Leichtenstern had examined a limited range of cases and because of inadequate methods of examining cultures. Sandground examined 37 cases at Honduras all of tropical origin—17 of which showed only the direct cycle (without free-living adults) the remainder showing both, but always with a marked preponderance of the direct. The indirect or heterotrophic cycle was never exhibited alone. He is unable to explain this phenonomon. Sandground considers that previously published figures for the incidence of Strongyloides are misleading as the other nematodes are usually diagnosed by some concentration method while Strongyloides larvae can only be adequately examined in smears, when light infections are easily overlooked. He therefore employs the method used by CORT, i.e., a mixture of faeces and charcoal is cultured on filter paper for a few days (30 hours is sufficient in the tropics) and then larvae are isolated by a modified Baermann technique. Of 105 stools examined by smear, brine flotation, and culture, Strongyloides was obtained 13, 0, and 37 times respectively, while hookworm, examined by the two latter methods, were found on 48 and 45 occasions respectively.

He concludes that Strongyloides infection is probably considerably more frequent than is revealed by ordinary diagnostic methods and is by no means so insignificant as is generally believed.

T. W. M. C.

SANDGROUND (J. H.). **The Rôle of** *Strongyloides stercoralis* **in the Causation of Diarrhea. Some Observations on the Condition of Dogs and Cats Experimentally Infected with this Parasite.** – *Amer. Jl. Trop. Med.* 1926. Nov. Vol. 6. No. 6. pp. 421–432. [19 refs.]

Although Strongyloides is very common in tropical and some subtropical countries, its pathogenicity is still little understood. NORMAND's belief that it caused Cochin China diarrhoea was not generally accepted since many organisms which are capable of causing diarrhoea were unknown to him. GRASSI, DARLING and others, however, believed that it was the cause of an irregular but chronic diarrhoea, and this view seems to be gaining ground, although the causal relationship with the condition has not yet been proved. Sandground points out that the parasite penetrates deeply into the mucosa or even submucosa, where it lays its eggs—often causing proliferation of the epithelium and infiltration of the intraglandular stroma. He has infected dogs and cats with *S. stercoralis* of human origin, and very typical pictures of acute diarrhoea were observed in most of the dogs and a few of the cats. In some cases the stools were dysenteric. He is yet unable to say whether the symptoms are caused by the mechanical irritation of the parasites or by a toxaemia.

T. W. M. C.

OUDENDAL (A. J. F.). Die Darmwand bei Anguilliasis intestinalis. [**The Intestinal Wall in Strongyloides Infection.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 510–520. With 9 text figs. [4 refs.]

Oudendal considers that the parasitic development of Strongyloides is as follows. The ovigerous specimens of Strongyloides penetrate into the Lieberkühn glands and, recurving their bodies in the fundus, lay one or more eggs which develop larvae. Each egg is surrounded by a more or less altered epithelial gland. The larva penetrates into the gland wall, and moults near by, leaving the old skin in the lumen of the gland. (The larvae swarm into the surrounding mucosa, near to, but not in, the muscularis mucosa ; they do not penetrate the blood vessels or lymph channels.) Finally it returns to the gut lumen, either directly or by perforating the duct of a gland. The epithelial cells may be destroyed by the violent motion of the larvae during ecdysis.

T. W. M. C.

MATSUMOTO (K.). **A Case of** *Strongyloides stercoralis.*—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. June. No. 255. English summary. p. 7 [In Japanese.]

The patient suffered from chronic diarrhoea and anaemia caused by Strongyloides and Ancylostoma—the latter was more easily expelled

than the former, which alone remained after treatment. Some weeks later eosinophilia was still present in a high degree and the excretion of gastric juice had decreased.

R. T. L.

Rose (F. G.). **Studies in Filariasis.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. June 17. Vol. 20. No. 3. pp. 198–205. [3 refs.]

Rose has conducted a number of experiments with the larvae of *F. bancrofti*, and finds that the migration of the larvae to the cutaneous blood proceeds from about 6 p.m. till 6 a.m. Larvae in hypotonic saline are very much larger than those in hypertonic saline while similar differences are observed between larvae in the venous and cutaneous vessels, those from the cutaneous blood at night being much larger than those from the venous blood at the same time. Those in the venous blood at midday are much larger than those in the same situation at night, while if the periodicity is reversed the larvae in the cutaneous blood appear larger during the day than at night in the normal individual.

T. W. M. C.

Wail (S. S.), Popow (P.) & Prjadko (F.). Ueber die pathologisch-anatomischen Veränderungen bei Filariosis. [**On the Pathological Anatomical Changes in Filariasis.** *Virchows Arch. f. Path. Anat. u. Physiol.* 1926. Mar. 3. Vol. 259. No. 3. pp. 642–646. With 4 figs.

Microfilariae occur in every crow killed at the Moscow Tropical Institute. The adults, which in some cases could be identified as the species *Diplotriaena tricuspis* Fedtschenko, 1874, were found in the lungs, pericardium and occasionally in the muscles. Histological examination of the various organs of the crows revealed the microfilariae in the lungs and brain capillaries. In the lungs the microfilariae were present in large numbers both in the capillaries and in the lung tissue itself. Patches of haemorrhage were also noted here. The brains examined showed remarkable changes; the capillaries appeared distended with the parasites and very numerous degenerated ganglion cells with shadowy outlines were seen surrounded by rosettes of glia cells, some of which had penetrated into the ganglion cell itself. The plasma appeared pale, and the nuclei in a state of hyperchromatosis. Fragmentation of the Fibrillae was apparent. The whole presented a picture of neurophagia. The changes described were to be correlated with the mechanical interference with the circulation caused by the blockage of the brain capillaries with the parasites and also with the secretion of toxic substances by the microfilariae.

The authors hoped that their observations would show the importance of a more exhaustive study of the pathological anatomy of filariases in man and that such a study would throw light on the various clinical features of the disease.

R. T. L.

i. Guzmán (P. A.). La Filariosis en Venezuela. [**Filariasis in Venezuela.**] —*Gac. Med. de Caracas.* 1926. Jan. 31. Vol. 33. No. 2. pp. 27–30. [13 refs.]

ii. Rizal (Leoncio Lopez) & Padua (Regino G.). **Brief Report of Filaria Survey in the Philippines.**—*Jl. Philippine Islands Med. Assoc.* 1926. Sept. Vol. 6. No. 9. pp. 298–300.

iii. Wu Hsiang Feng. **Note on the Movement of Microfilaria bancrofti.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 411–412.

i. Dr. Guzmán gives short notes of the clinical condition and blood examinations of eight cases of elephantiasis in Venezuela. One of these cases had also lymphatic abscess.

ii. An examination of 639 prisoners in 19 provinces of the Philippines showed that 21 harboured nocturnal and only one diurnal microfilaria in their blood.

iii. In urine, the movement of the larvae is "spring-like" but they slowly die in urine long voided.

T. W. M. C.

Fülleborn (F.). Ueber den Infektionsweg bei Askaris. [**The Track of Infection with Ascaris.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 1. pp. 84–86.

While Ascaris larvae are able to pass through the capillaries of the general circulation, they become wedged in the finer capillaries of the lungs; but by breaking through into the alveoli, some of the larvae are able to bore back into the capillaries on the venous side and so are taken to the heart and distributed thence in the general circulation.

After being mechanically forwarded from the alveoli to the trachea by the action of the ciliated epithelium of the bronchioles they are taken into the intestine with the saliva where they become sexually mature. Development takes place especially in the smaller bronchioles which is possible (in spite of the ciliated epithelium) on account of their partial blockage resulting from the pneumonia set up by the boring of the worms.

The amount of tissue bleeding depends on the compactness or looseness of the tissue in which the vessel is imbedded. In the brain this bleeding is slight which makes intelligible the lack of cerebral symptoms in even heavy Ascaris infection. The extent of "vessel boring" in the different organs depends on the number of larvae in the arterial blood. Variations in this number in different arteries are to be connected with the presence of a marginal zone 0·2–0·3 mm. broad, which remains free of larvae, and it depends on the acute or more right-angled branching of the artery as to what quantity of the larvae-containing stream flows through.

R. T. L.

Koidzumi (M.), Hiraishi (S.) & Koino (H.). **Studies on Ascarides.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. p. 335.

Although morphologically indistinguishable, there is no evidence that the pig Ascaris can mature in man and vice versa; indeed Koino's experiments seem to prove the reverse. Hiraishi carried out feeding experiments on pigs for over four years and found that pigs fed on

human ascaris and on porcine ascaris gave alike negative results; if, however, vitamin A was withheld from their diet, the animals were infected with both strains. Koidzumi and Koino found a cytological difference between the two forms: namely, the haploid number of chromosomes in the human ascaris appears to be 12, while in the pig form it is 13.

[This article appears to be a summary.]

T. W. M. C.

SHIMAMURA (Torai). **A Chemical and Pharmacological Study on the Toxic Principle of the Ascarid.** *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 337–339.

[This appears to be a summary.] In ascarids is a toxic substance (it is also found in many different species of nematodes) which when given intravenously to guineapigs and horses causes anaphylactoid shock reactions. The writer calls this Ascaron and it appears to consist mainly of albumoses and peptones. In its purified state 0·1 mgm. is lethal for a horse and 0·01 mgm. for a guineapig. In the latter animal the predominant symptom is bronchospasm; while in the horse there is sweating, hyperaemia of the visible mucous membranes, abundant nasal discharge and a colicky diarrhoea. On autopsy, the blood is incompletely coagulated and there is a haemorrhagic inflammation of the large intestine. The action of ascaron in the guineapig resembles that of histamine, but it differs from this drug in several respects. Horses may be rendered resistant to 300 times the lethal dose, but no antibodies can be demonstrated in the blood. The writer considers that the action of this toxic substance is not anaphylactic, but anaphylactoid.

T. W. M. C.

FISHER (C. F.) & BITTINGER (W. P.). [**Verminous Abscess.**]—*West Virginia Med. Jl.* Charleston. 1926. June. Vol. 22. p. 314. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Aug. 7. Vol. 87. No. 6. p. 442.]

In a boy of 16 an abscess about the size of a walnut was found on the ileum. It was located in and formed by the bowel wall and there was no opening between the pocket and the lumen of the intestine. There was a single *Ascaris lumbricoides* and about a dram of a yellowish-brown fluid in the abscess.

R. T. L.

i. MORINAKA (K.) & ISHIKAWA (S.). **The Treatment of Ascariasis by Injection of Santonin Preparation.**—*Jl. Oriental Med.* 1926. July. Vol. 5. No. 1. English summary pp. 1–4. [5 refs.] [In Japanese.]

ii. NANHORYA (H. B. D.). **A Case of Acute Intestinal Obstruction caused by** *Ascaris lumbricoides.*—*Indian Med. Gaz.* 1926. Aug. Vol. 61. No. 8. pp. 396–397.

iii. OGATA (Seiji). [**Studies on the Prevention and Extermination of Ascaris.**]—*Jikwa Zasshi* (*Jl. Pediatrics*). 1925. Dec. No. 307. [Summarized in *Japan Med. World.* 1926. Apr. 15. Vol. 6. No. 4. p. 98.]

i. Morinaka and Ishikawa have treated 40 cases suffering from Ascaris infection with subcutaneous, intramuscular or intravenous injections of "Santonin- sodium," all the worms being expelled in 35 of the cases.

ii. Nanhorya reports acute intestinal obstruction, caused by a mass of 37 Ascaris in a native boy three years old; 43 worms were passed later and after a successful operation.

iii. The simplest method of destroying the eggs of Ascaris on vegetables is to boil them, salting being ineffective.

T. W. M. C.

SCHWARTZ (Benjamin). **Specific Identity of Whipworms from Swine.** —*Jl. Agric. Res.*. 1926. Aug. 15. Vol. 3. No. 4. pp. 311–316. With 2 figs. [10 refs.]

Schwartz has compared whipworms from man, chimpanzee, monkeys and pigs and is unable to find any features by which these forms may be differentiated. *T. trichiura* of man and *T. suis* of pigs are generally separated by means of the shape of the spicules and the spicular sheath, but the differences between these organs he finds to be merely such variations as may be found within a single species. He concludes that *T. suis* must be regarded as a synonym of *T. trichiura*.

T. W. M. C.

SCHWARTZ (Benjamin). **A Possible New Source of Infection of Man with Trichuris. With a Consideration of the Question of Physiological Varieties among Helminths.**—*Arch. f. Schiffs- u. Trop. Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 544–547. [8 refs.]

Schwartz draws attention to the fact that the whipworms of man and pig are indistinguishable morphologically and that, in the absence of biological evidence to the contrary, the pigs must be considered as reservoir hosts to man. He warns against placing too much reliance on morphological identity as a criterion of biological identity. He has unsuccessfully fed human ascaris eggs to pigs and porcine ascaris eggs to monkeys.

T. W. M. C.

MILLER (Newton). **Living Trichinella Thirteen Years Old.**—*California & Western Med.* 1926. Nov. Vol. 25. No. 5. pp. 633–634. With 1 text fig.

13 years ago, Mrs .E. L. ate some pork sausages and four days later suffered from abdominal pains and cramps with diarrhoea. Shortly after recovery she experienced a stiffness and intense generalized muscular pains similar to rheumatism, accompanied by anaemia, oedema and thirst. This eventually disappeared. During an abdominal operation in 1923, trichina cysts were found in a piece of excised muscle. Histologically these seemed to shew no signs of degeneration and the writer concludes that they were alive and assumes that they had resulted from the infection of 13 years previously. The patient is still alive.

R. T. L.

SAITO (Masao). [**Development of** *Hepaticola hepatica*. **A Supplementary Report.**]—*Taiwan Igakkwai Zasshi* (*Jl. Formosan Med. Soc.*). 1925. Oct. No. 247. [Summarized in *Japan Med. World.* 1926. June 15. Vol. 6. No. 6. pp. 153–154.]

Eggs of *Hepaticola hepatica* take three months at 16°–20° C. or one month at 33°–34° C. to develop. The larvae may reach the liver through the portal

vein or through the abdominal cavity. They may be carried to abnormal situations (brain, kidney) by the circulation. Eggs are passed in 27 to 28 days after infection. The normal life cycle may be completed in the dog, but not in the rabbit.

T. W. M. C.

KOINO (Hisashi). **Studies on the Development and Structure of the Larvae of *Trichostrongylus orientalis*, and their Migratory Course in the Host.**—*Far Eastern Assoc. Trop. Med Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 467–470.

Trichostrongylus orientalis is not uncommon in Japan. The egg resembles that of the hookworm, but is much longer and is thickened towards the anterior pole and has a slight dorso-ventral asymmetry. At 26°–30° C the eggs hatch in 40–45 hours; the first moult occurs in 2–3 days, the second in 3–4 days. The infective larva normally remains in its sheath, but may exsheath after a month. The migrations and mode of infection seem to be similar to that of the hookworm. In mice infected by mouth, the larvae penetrated the stomach or duodenum and so reached the lungs, passed up the trachea and were swallowed a second time. The larvae may also penetrate the skin, following the same route, but skin infections are very light, and Koino considers that oral infection is the normal and the commoner mode. He states that the larvae may be distinguished from those of the hookworm and promises the details in a future paper.

T. W. M. C.

ESPIÉ (A.). Note préliminaire sur un nouveau parasite intestinal humain de la Tunisie (*Trichostrongylus* sp. ?). [**A New Human Intestinal Parasite in Tunisia.**] *Arch. Inst. Pasteur de Tunis.* 1926. Sept. Vol. 15. No. 3. pp. 283–285.

Espié has found on five occasions in human stools, a few eggs resembling those of hookworms, but ovoid, elliptical or sometimes pyriform in shape, measuring 75 to 105 μ long by 40 to 50 μ broad, the average being 90 μ by 45 μ. They occur in the morula stage. He believes that they belong to some species of Trichostrongylus—a genus of nematodes which has not hitherto been found in French northern Africa, but is not uncommon in Egypt.

T. W. M. C.

CHANDLER (Asa C.). **The Prevalence and Epidemiology of Hookworm and other Helminthic Infections in India. Part I. Introduction and Methods. Part II. Eastern Bengal.**—*Indian Jl. Med. Res.* 1926. July. Vol. 14. No. 1. pp. 185–194. [14 refs.]; 195–218. With 1 map. [6 refs.]

Although hookworm infection and hookworm disease are known to be prevalent in India, there is little accurate information as to the incidence and local epidemiology. Chandler considers that jails and asylums, where most of the large series of examinations have been made, are not suitable for study when the intensity as well as the incidence is to be considered. About 100 samples of stools were collected in each selected locality and posted to Calcutta, where they were examined by Lane's D. C. F. technique for incidence and Stoll's

method for degree of infection and Infection Index (see this *Bulletin*, Vol. 22, p. 888) calculated. Soil samples were also examined by a modified Baermann technique. Several local cities in eastern Bengal were surveyed and it was found that the amount of hookworm infection accurately reflected the different conditions with respect to defaecation habits. Where latrines were used as in the Jobarpur and Sodepur localities, the incidence was found to be between 60 and 65 per cent., the average e.p.g. were under 100 and the infection index was 60-65. On the fringe of the latrine belt, e.g., Sitakund locality, the figures are respectively over 90 per cent., 221, and 128: while outside the latrine belt (Dhala locality) the figures were over 98 per cent., 340, and 156. Ascaris and whipworms were common in all areas, suggesting that the water supply was not free from contamination. Chandler considers that hookworm disease in these districts can be easily controlled by the adequate use of latrines.

T. W. M. C.

CHANDLER (Asa C.). **The Prevalence and Epidemiology of Hookworm and other Helminthic Infections in India. Part III. Central, Western and Northern Bengal. Part IV. Assam and the Hill Areas of Eastern Bengal. Part V. Tea Estates of Assam and Bengal.**—*Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 451–480. With 1 map. [15 refs.]; 481–492. With 1 map. [1 ref.]; 493–504. [4 refs.]

Continuing his surveys of helminthic infections in India, Chandler has examined various areas in Bengal and Assam.

Part III. *Central, western, and northern Bengal.* In the villages of the plains the amount of hookworm is small, the general incidence being about 80 per cent., the e.p.g. about 200, and the index of infection 126. In the Sunderbands on the coast infection is negligible; but in Darjeeling the incidence rises to about 90 per cent., the average e.p.g. are 900, and the infection index is 267. Apart from the districts immediately inland from the Sunderbands, latrines or standing places are absent and pollution of the soil all round the villages is the rule. Beetles actively bury the faeces and domestic animals, especially pigs, dogs and cattle, devour the stools. Heavy clay and light sandy soils are unfavourable to hookworms; and the high rate in Darjeeling is due to favourable soil, abundant moisture, and moderate temperature. Chandler considers that the dry season of four to six months destroys many of the larvae, and as adults are quickly lost during this period and are not being replaced, fewer eggs are available at the beginning of the next wet season. To this he ascribes the lightness generally of hookworm infection. Ascaris and whipworm are common but irregularly distributed. Strongyloides was only common near Khulna and Jessor. Hymenolepis was rare except in parts of Asanol, where he found a 20 per cent. infection in one colliery lines. Taenia is very rare, except in Bhutan and Tibet, where the habits of the people make it a very common parasite. Fasciolopsis was only found on three occasions, although it is common in pigs. A local water bulb (*Trapa bicornis*), which is eaten by the natives, may carry the metacercaria. As prophylaxis, Chandler suggests the encouragement of the use of latrines or standing places of a type which does away with fouling and bad odour.

Part IV. Assam and the Hill areas of eastern Bengal. Here hookworm infection is much more severe. In the western part, the infection index was less than 100, but elsewhere it varied from 190 to over 300. Latrines are only found in Manipur (where the infection is light): elsewhere soil pollution is general. In these areas also conditions are favourable for heavy infestations. The dry season is shorter and the temperature lower than in Bengal. Ascaris and whipworm are common and, except in Manipur, 70 to 90 per cent. of the inhabitants are infected. Trichostrongylus was common in the Chakmas and Mughs on the Chittagong hills, but not elsewhere. *H. nana* was only found in 8 per cent. of the Manipuis, while *F. buski* was only common in the Manipur valley, although it occurs elsewhere. *G. hominis* is stated to be commonly found in the Pasteur Institute at Shillong. Four instances of what Chandler considers to be pseudoparasitism by a fluke of the genus, *Isoparorchis* (*I. trisimilitubis*?) have been reported from Manipur. This fluke appears to be common in the air bladders of a local fish ("Boal Fish") and it was asserted that infections with the fluke were associated with the eating of the fish.

Part V. Tea Estates of Assam and Bengal. Hookworm is higher here than in the rural populations elsewhere—the infection index ranging from over 400 (in Darjeeling and in the northern Dooars) to 248 (in Cachar). Soil pollution is universal and most of the human infection takes place from standing on old stool sites during defaecation. Ascaris and whipworm are common, while Trichostrongylus occurs in 10 per cent. of the coolies in Dooars and Himalayan gardens. As in the previous cases, the use of simple non-fouling latrines is advocated, which he believes would be readily used.

T. W. M. C.

KORKE (Vishnu T.). **Observations on Ankylostomiasis in some Areas in British India.**—*Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 383–407. With 2 text figs. & 1 map. [11 refs.]

Korke finds that hookworm is prevalent (average of 43 per cent.) in the convict settlements in the Behar area—the common species being *A. duodenale*. *N. americanus* is rare. Ascaris and whipworm are also common, while Toxascaris, Strongyloides, Trichostrongylus, Oxyuris and *Taenia saginata* also occur. Microfilaria were found in 30 out of 107 night examinations, while 37 day examinations were negative.

T. W. M. C.

BARNES (M. E.) & RUSSELL (Paul F.). **General Survey of Hookworm and Helminth Infections.**—*Malayan Med. Jl.* 1926. Sept. Vol. 1. No. 3. pp. 20–27. With 4 graphs.

Using a Willis-Molloy flotation technique, the Stoll egg count method, worm counts and haemoglobin readings, Barnes and Russell found 73 per cent. (out of 4,620) infected with hookworm in the Straits Settlements. The highest infection was among the Malays (79 per cent.) and the Indians (78 per cent.), but the other races (except the Europeans, with 35 per cent. infected) were only slightly less. The

maximum severity was found in Malacca; the intensity is highest in agricultural workers and lowest in domestics. Ascaris and whip-worm are also common.

T. W. M. C.

CORT (W. W.), GRANT (J. B.), STOLL (N. R.) & other collaborators. **Researches on Hookworm in China. Embodying the Results of the Work of the China Hookworm Commission, June, 1923 to November, 1924.** *Amer. Jl. Hyg.* Monographic Series. No. 7. 1926. Oct. pp. ix + 398. With 7 plates, numerous text figs. & charts. [Numerous refs.]

The methods used in the gathering of information by Cort and his collaborators were similar to those used in their West Indian investigations, viz. the Baermann apparatus for isolating larvae and the Stoll dilution egg count method. In China, however, Ancylostoma as well as Necator is present (in about the proportion of 3:2), and it was found that the egg count per gram divided by 100 represented the approximate number of adult hookworms harboured—a much higher figure than in their previous studies—and they state that this factor must be obtained for each large area where it is being used. Much of the rest of the information was obtained by means of questionnaires sent out to medical missionaries. In addition to their studies of egg counts, soil pollution and infestation (as in the West Indies), it was necessary to investigate the use of human excrement as manure.

China may be roughly divided by a zone extending from the Yangtze to the north of Szechwan. North of this zone lies Northern China, with cold winters, low rainfall, millet and wheat cultivation, and the dry use of human fertilizer. Hookworm disease does not exist as a public health problem in this area, probably because of the climate. South of the zone lie Central and Southern China, where the temperature is higher, rice, cotton, mulberry, etc., are cultivated and the wet method of using human faeces is employed. Both hookworm infestation and disease are widely distributed and in certain areas are of considerable importance. In the Yangtze area, in Soochow, in Kwangtung, and in Wuchow it is one of the more important diseases. Hookworm disease is largely a rural problem (except in the few cases where vegetable cultivation is practised within the city walls) and is an occupational disease spread almost entirely by the use of night soil as fertilizer. Contrary to general belief, it was found that hookworm was not spread in rice cultivation, but that actually the use of night soil on the paddy fields was an important means of control. Cotton cultivation only causes a subclinical infestation. Vegetable culture is not an important source of infection either, under normal circumstances. Mulberry cultivation is *the* important source of the disease. The night soil is stored for a considerable period before use in May, when it is applied to the trees to prepare food for the heavy summer brood of silk worms. To ensure rapid penetration, the soil is broken up round the trees and the manure applied close to the trunk. Two to four weeks later the pickers enter the field (at the peak of the intensity of the soil infection) and stand close to the trunk to pick the leaves, wearing thin sandles and often standing in mud. The conditions for human infection are therefore ideal, and the severity of the disease is due to this few days contact each year with the infested mulberry trees during the second picking of the leaves.

Hookworm disease in China is therefore associated, not with general but with particular methods of fertilization employed with certain crops. Control is accordingly not a general sanitary problem, but centres round a purely economic factor.

Experiments showed that the danger did not come from infective larvæ in night soil, but from viable eggs which develop after the manure is spread. Over 95 per cent. of the eggs are destroyed in one month in night soil stored at ordinary summer temperature, and after two months practically all are destroyed. Stirring the faeces seems to reduce this time by half. It was found that the addition of lime (preferably, but not necessarily, unslaked) to the night soil in the proportion up to 1 part to 500 parts of faeces, in 6–12 days prevents the development of the ova.

Cort suggests that organized hookworm campaigns could be profitably carried out in the mulberry regions in the Yangtze delta, Kwangtung, and Szechwan. Stoll estimates that 24 million tons of human faeces, with a value of about 900 to 3,000 million dollars Mex., are annually used in China. [In reading this chapter it is necessary to remember that *billion* has not the same meaning in Britain as in the United States.

Economically it is impossible to eliminate the use of night soil as manure, and control depends on modification rather than suppression. These methods must be cheap and alter as little as possible present practice. The use of other fertilizers could be urged; or adequate storage (no manure being used which has not been stored for at least a month), the addition of lime to the night soil, and personal prophylaxis (heavy shoes, etc.) are suggested as theoretical means of control; but it is recognized that the education of a conservative population (night soil was in use a thousand years before our era) with a high percentage of illiteracy, often in inaccessible regions, is a more complicated question than it seems at first sight. It is suggested that an adequate Chinese medical personnel would have a very great influence in assisting to control the disease.

T. W. M. C.

MANALANG (Cristobal). **Studies on Ankylostomiasis in the Philippines.** —*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 351–368. With 5 maps.

Although there is a fairly high hookworm incidence in the Philippines the disease is rare. Latrines are now being widely used and in some places householders without latrines are penalized. Carbon tetrachloride appears to have a definite ovicidal effect on Necator, which was not observed with oil of chenopodium or thymol.

Of five deaths associated with the hookworm campaign, three only could be even remotely ascribed to it; these three cases suffered respectively from gastric carcinoma, gastric ulcer, and duodenal ulcer.

The commenest species of hookworm in the Philippines is Necator, but in some spots *A. duodenale* is common. A few cases of *A. braziliense* were observed in man; it is very common in dogs and cats locally. The writer mentions two human infections with *A. caninum*, but it is not clear whether he is reporting these from his own observation or not.

T. W. M. C.

MANALANG (Cristobal). **Hookworm Infestation among Japanese Immigrants and Residents.** *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 369–377.

475 Japanese immigrants to Zamboanga (Philippines) were examined for helminths. 54 per cent. were found to be free from infection, 17 per cent. had Ascaris, 25 per cent. whipworms, 6·7 per cent. hookworms, and 3·5 per cent. Strongyloides. An examination of 41 Japanese labourers, who had been in Davao for some time, shewed that all were infected with hookworm.

T. W. M. C.

CARR (Henry P.). **Observations upon Hookworm Disease in Mexico.** —*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 421–461. With 4 text figs. [4 refs.]

The principal species of hookworm in Mexico is *Necator americanus*, but about 8 per cent. of Ancylostoma are found. The parasites are confined to certain well-defined areas along the coast of the Gulf of Mexico and on the southern part of the Pacific coast. The incidence of the disease is highest in young males under 15 and lowest in females over 15. A high percentage of the labouring population is infected and the maximum degree of infection is reached about 20 years. This decreases within the next ten years to about half and remains constant about this figure. Carr finds that there is no decrease of haemoglobin in cases with under 500 eggs per gramme, but that over that figure, there was a significant lowering of haemoglobin.

T. W. M. C.

HAUSHEER (W. C.) & HERRICK (C. A.). **The Place of the Smear in Hookworm Diagnosis.**—*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 136–148. With 1 text fig. [16 refs.]

The authors consider that the smear method of examining faeces is a useful routine method for the practitioner, as the cases missed will not be of clinical importance owing to the lightness of the infection. It also saves time by eliminating heavy infections before using a concentration technique. They state that patients negative to two 25 by 25 mm. smears may be considered to have less than 500 eggs per gramme, and so in campaign work the method is valuable to determine when to discontinue treatment. The smear method is accurate for over 500 eggs per gramme, doubtful for from 300–500, and highly inaccurate for under 300 eggs per gramme of faeces.

T. W. M. C.

HUNG (S. L.). Ueber den Nachweis von Hakenwurmeiern im Kote, den Wert ihrer quantitativen Bestimmung und eine einfache neue Methode für letztere. **The Demonstration of Hookworm Eggs in Faeces. A Simple Method for their Quantitative Estimation.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 399–342. With 3 text figs. [34 refs.]

Hung discusses the merits of various egg collecting techniques in common use for the estimating of numbers of hookworm eggs present in faeces (BASS, FULLEBORN, KOFOID & BARBER, WILLIS, LANE, STOLL,

and CALDWELL). He describes a new technique which he declares compares very favourably with previous methods, being faster than the Stoll and as accurate as the Lane. This he calls the "Hamburg Cover-slip method."

A circular glass vessel (about 5 cm. in diameter) with a hollow sunk into the base is used, but this may easily be improvised by the use of paraffin wax. In the hollow is placed 2 gm. of faeces and then saturated salt solution is poured in to cover the mass. After ten minutes three coverslips, which are allowed to float on the surface, are removed and placed on slides and the number of eggs under each is counted. Using the formula $\frac{a \pi r^2}{n^2}$ (a, average number of eggs per coverslip, r, radius of vessel, and n^2, area of coverslip) he obtains the number of eggs in 2 gm. of faeces. The following corrections have been found necessary: when the total number is under 300 ... no correction.

between 300 and 500 ... increase by 1/14
500 and 650 ... increase by 1/5
over 650 ... increased by 1/3

T. W. M. C.

HILL (Rolla B.). **The Estimation of the Number of Hookworms harbored, by the Use of the Dilution Egg Count Method.**—*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 19–41. [10 refs.]

In 1924, STOLL pointed out that the number of eggs per gramme of faeces reflects the degree of infestation in numbers of hookworms, but as his factor was derived from a small number of cases only, Hill decided to check his results from a larger series. The writer states that "the conditions which influence egg production are not yet fully understood" and at present all factors give somewhat varying results. Moreover, the methods by which these are calculated are not above suspicion. In this series, 93 cases were fully studied, all the faeces were collected over a period of two or three days and the eggs per gramme estimated by the Stoll technique. All the worms (*Necator americanus* was almost exclusively present) were then expelled with a carbon tetrachloride and chenopodium treatment (only cases in which all the parasites were expelled are included in the series). Using the same methods as STOLL, it was found that the number of eggs per female worm per day amounted to 2,693, while the eggs per gramme per female were 18·3—Stoll's factor being 44 or over twice as large. The author suggests that all counts per gramme should be reduced to a basis of formed stools for purposes of comparison.

T. W. M. C.

SOPER (Fred L.) **Comparison of Stoll and Lane Egg-Count Methods for the Estimation of Hookworm Infestation.**—*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 62–102. With 17 text figs. [12 refs.]

The author used LANE'S technique modified by stirring the contents of the tube by means of a small wire rod between each spin. He found that this resulted in a higher percentage of eggs in all spins except the first, but that in some cases as many as 30 spins were necessary to recover all the eggs in heavy infections. He finds that after the fourth spin as many as 35·6 per cent. of ova are still remaining, and considers that the Lane method must be pushed to finality to be

of value as a measure of the number of eggs present—a time consuming procedure when used for field work. On the other hand, it is excellent for picking up light infections. The Stoll technique does not secure an even distribution of eggs, but when more than one count is made they tend to be compensatory. This method is inferior to LANE's as a measure of rate of infection in groups with lightly infected individuals; but Soper believes that average Stoll counts are as reliable as average Lane counts, in estimating the degree of infestation of groups containing lightly infested individuals and are superior with heavily infested individuals.

T. W. M. C.

HAUSHEER (W. C.), HERRICK (C. A.) & PEARSE (A. S.). **Evaluation of the Methods of Stoll and Lane in Light Hookworm Infections, and Accuracy in Diagnosis of the Willis Floatation Method.**—*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 118–135. With 1 text fig. [16 refs.].

Using the Lane technique "pushed to finality" and both small and large drop Stoll methods (this *Bulletin*, Vol. 23, p. 776) for a series of 70 stools, the authors consider that the D. C. F. method gave extremely accurate results in diagnosis, but it was more time consuming than the dilution methods, which indicated a greater number of eggs present than did the D. C. F. They found that in cases with 600 or more eggs per gram, the small drop dilution method was as accurate as the large drop, but that it was useless for stools with much below 200 e.p.g. A study of Willis flotation method showed that provided that faeces are thoroughly comminuted in the salt solution, that salt with a Sp. Gr. of 1,150 to 1,200 is used and that the specimens are promptly examined before the salt destroys the ova, the diagnostic results are extremely good—the few cases missed being under 100 e.p.g.

T. W. M. C.

ALFREDO DUARTE (A.). Estudio e importancia del indice cuantitativo de la infección por la uncinaria, según el procedimiento de Stoll. [**The Quantitative Index of Hookworm Infection by Stoll's Method.** —*Repert. de Med. y Cirug.* Bogota. 1925. Dec. Vol. 17. No. 3. (195.) pp. 139–173. With 5 charts in text.

Duarte has made a detailed study of 700 cases by Stoll's method of counting ova in human stools. This simple method gives in his opinion precise indications of the number of eggs present. The manner of egg counting is useful for other purposes, for ascaris and whipworm eggs can be estimated equally well. Stoll's technique may be applied to ascertain the number of worms present in an individual. The larger the number of persons unsuspected of hookworm infection who are examined, the more accurate the results.

R. T. L.

USAMI (Kenichi). Ueber eine neue Züchtungsmethode der Ankylostomumeier, insbesondere ueber die Gewinnungsmethode der ganz sauberen Ankylostomumlarven. [**A New Culture Method for Ancylostome Eggs.**—*Wien. Klin. Woch.* 1926. May 20. Vol. 39. No. 21. pp. 595–597.

Usami points out, that there are many methods of searching for eggs in stools, but none are absolutely reliable. He prefers to use the

following technique, which is based on the recognition of the larvae which hatch out from the eggs. The faeces are mixed with 5 or 6 times their bulk of powdered charcoal and made into a paste with water. The mass is spread over the bottom of a petri dish (to a depth of about 1/3 cm.) and incubated at about 37° C for three or four days. The surface of the culture is then covered with a layer of melted agar (a 2 per cent. solution which has been cooled to about the same temperature as the culture before application). The agar which forms a layer of about 1/3 cm. is allowed to solidify and is covered with water at a suitable temperature for about twenty minutes. The water is then decanted and examined, together with the water of condensation on the lid of the petri dish, for the presence of larvae. If none are present the water is allowed to stand on the agar for 24 hours. If no larvae are found, then, the presumption is that no eggs were present. This technique is called by Usami the "Agar covering method"; but as sometimes particles of culture material escape into the water at the edge of the dish, he has a modification specially designed to secure clean cultures, which is called the "Agar hollow method." The agar is poured over the culture as before and a watch glass is pressed down on to its surface so as to form a hollow, the bottom of which is ½ cm. from the top of the culture. When the agar is solid, the watch glass is removed, and the water is poured into the hollow, and the larvae congregate there, free from any faecal material.

T. W. M. C.

FÜLLEBORN (F.) Experimenteller Nachweis für den Uebergang von Hakenwurmlarven aus dem Blute der Lungenarterien in die vom grossen Kreislauf versorgten Organe. [**Experimental Proof of the Passage of Hookworm Larvae from the Blood of the Pulmonary Artery to the Organs supplied by the Greater Circulation.**] —*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Nov. 1. Vol. 30. No. 11. pp. 679–684. [12 refs.]

Fülleborn has conducted a series of experiments on rabbits with the larvae of *Uncinaria stenocephala*, of the dog, and finds that 24 minutes and 6¼ hours after the injection of the larvae into the pulmonary artery a few may be found in the brain and kidneys. These larvae are considerably thicker than the infective larvae of *Strongyloides*, and are accordingly less able than that species to pass through the narrow capillaries of the lungs. Nevertheless, they are in some instances able to do this and so escape from the pulmonary artery into the pulmonary vein.

T. W. M. C.

YOKOGAWA (S.). **On the Oral Infection by the Hookworm.** *Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Nov. 1. Vol. 30. No. 11. pp. 663–679. [1 ref.]

——. **On Oral Infection by** *Ankylostoma duodenale.*—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* pp. 347–349.

Yokogawa has fed infective larvae of *A. caninum* to tracheotomized dogs and finds that the larvae appear to develop normally in the intestine without leaving it, as no larvae could be found in the trachea

after several careful searches daily, until the animal was destroyed. A very few (6 out of 3,059) were found in the lungs on autopsy, but he considers these as strays. He concludes that the pulmonary route is not essential for their development. He found also, in comparing larvae which had passed through the lungs, with infective larvae from cultures, that the latter displayed more resistance to artificial and natural gastric juices. Mature larvae of *A. duodenale* and *A. caninum* which had passed through the lungs of rabbits and guineapigs (i.e., "improper" hosts) were fed to other guineapigs and were found 24-28 hours later in the lungs, trachea and oesophagus. These were fed again to a young guineapig and to a mouse and 24-48 hours later were recovered from the lungs and trachea. He believes that this demonstrates that larvae which pass through the lungs do not acquire any particular property as the result of this journey; and that larvae fed to an abnormal host will continue to repeat this cycle until they die or are voided with the faeces. He concludes that hookworms do not leave the intestine of their proper host when swallowed, and that they migrate from the intestine of unsuitable hosts merely to escape from an uncongenial medium.

T. W. M. C.

HESS (Hermann). Die Hakenwurmkrankheit, unter besonderer Berücksichtigung der nervösen Erscheinungen, Temperatursteigerung und Allotriophagie. [**Nervous Symptoms, Fever and Pica in Hookworm Disease.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Apr. 1. Vol. 30. No. 4. pp. 141–148. [42 refs.]

The intensive investigations of LÖBKER, BRUNS and LUTZ failed to corroborate the presence of the nervous symptoms reported by SANDWITH and ASHFORD, as being connected with hookworm disease, as these could generally be ascribed to concurrent pellagra, beriberi or other deficiency diseases. There is still no agreement as to the occurrence of fever, or as to its etiology, but secondary infection of small intestinal wounds is probably partly responsible. Allotriophagy (pica) has seldom been observed in Europe.

R. T. L.

VAN THIEL (P. H.). Diagnostic différentiel des larves strongyloides du *Necator americanus* et de l'*Ankylostoma caninum*. [**Differentiation of the Larvae of *N. americanus* and *A. caninum*.**]—*Ann. Parasit. Humaine et Comparée.* 1926. July 1. Vol. 4. No. 3. pp. 228–232. With 1 text fig. [8 refs.]

Van Thiel adds further details to his previous paper (this *Bulletin*, Vol. 21, p. 969) on this subject, but promises a future still more detailed paper. In addition to the differences in the cephalic end and in the striations of the cuticle, already mentioned, he finds that the tail of *Necator* is the more pointed, the wall of the oesophageal bulb is more irregular, and the oesophageal intestinal junction is as wide as the bulb in *Necator* while it is much narrower in *Ancylostoma caninum*. A figure of the anterior end of a Necator larva is given.

T. W. M. C.

HILL (Rolla B.). **Hookworm Reinfestation for Three Years after Treatment in a Sanitated Area in Porto Rico, and its Bearing on Permanent Hookworm Control in the Group Studied.**—*Amer. Jl. Hyg.* 1926. July Supp. Vol. 6. pp. 103–117. With 1 text fig. 10 refs.

Using the dilution egg count method, a group of 300 people in an area in Porto Rico, which enjoyed a fair measure of sanitation, was examined before treatment and immediately after, and one and three years later. The incidence of hookworm infection was reduced from 90 to 19 per cent.; but the rate rose rapidly at first though more gradually afterwards, until after three years 58 per cent. were infected. The intensity of the infection was reduced 98 per cent. by treatment, but this only rose to 20 per cent. of the original in the same time. The greatest increase was in the farmer class, but children and old people were found to be acquiring hookworms more quickly than other groups. The writer considers that these results indicate the value of the intensive system of treatment developed by HOWARD in 1919. [See this *Bulletin*, Vol. 14, p. 159.]

T. W. M. C.

STILES (C. W.). **Comparative Value of Sodium Hydroxide, Copper Sulphate, and Fermentation in Disinfecting Human Excreta containing Eggs of Hookworms** (*Necator americanus*) **and of Ascaris** (*Ascaris lumbricoides*).—*Jl. Parasit.* 1926. Sept. Vol. 13. No. 1. pp. 47–55.

A 1 per cent. solution of caustic soda destroys hookworm eggs in excreta in 14 days in summer, 2 per cent. in 9 days, 5 per cent. in 6 days and a ·5 per cent. in four weeks. Under winter conditions with a 1 per cent. solution they live for 6 weeks and with a ·5 per cent. solution for 8 weeks. Copper sulphate may be as safe a disinfectant, but the question is still *sub judice*. 1 per cent. sulphuric acid, 1 per cent. calcium hypochlorite, fermentation and pine tar disinfectant are inferior to caustic soda. Fermentation is adequate if ample moisture is present and about 5 months time is allowed. It is suggested that so far as hookworms are concerned 1–5 per cent. caustic soda is one of the most efficient disinfectants for human excreta, and if properly treated thus, the night soil may be safely (as far as hookworm is concerned) used for fertilizer.

T. W. M. C.

EARLY (P. V.). **A Case of Subacute Combined Degeneration of the Cord associated with Ankylostomum duodenale and Achlorhydria.** – *China Med. Jl.* 1926. May. Vol. 40. No. 5. pp. 465–466.

The author gives a brief clinical record of a case shewing sub-acute combined degeneration of the cord in which the associated anaemia was possibly due in whole or in part to hookworm. The number of red cells was 750,000 per cmm. The haemoglobin on the Tallqvist scale was 10 per cent. The stained film did not present the typical picture of pernicious anaemia. No autopsy was obtained. [The report gives no indication of the intensity of hookworm infestation, although the presence of worms was ascertained by a microscopical examination of the stool.]

R. T. L.

PERERA (David). **Ankylostomiasis. Some Notes on 4,000 Cases, treated from October 1914 to April 1925.** *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 1. pp. 341–346.

The drugs used against hookworm in the Poonagalla Group Hospital, Ceylon, are normally oil of chenopodium and, a week later, thymol, a saline purge being given on each occasion. Oil of chenopodium should not be given to patients with jaundice. Diarrhoea and dysentery are frequently caused by hookworms—in the latter case, beta-napthol and thymol are the safer drugs to use. The writer emphasizes the establishment of an effective sanitation as the first stage in hookworm campaigns.

R. T. L.

MANALANG (C.). **Ankylostomiasis, IV—Chenopodium Treatment.**—*Jl. Philippine Islands Med. Assoc.* 1926. July. Vol. 6. No. 7. pp. 226–228..

———. **Ankylostomiasis, V—Thymol Treatment.**—*Ibid.* pp. 228–229.

Chenopodium in 3 cc. doses was administered to 57 patients suffering from hookworm. One dose cured 23, two doses cured 7 out of 21 and 3 doses cured 7 out of 8. In the case of those requiring more than one dose, 89·5 per cent. of the worms were expelled with the first dose. Ancylostoma was found to be less vulnerable than Necator.

Similarly 2·6 gm. of thymol was given once in 38 cases, curing 10, twice in 15 cases, curing 3, and 3 times in 10, curing 5. In the double treatments, 74·1 per cent. of the worms were expelled after the first treatment. Here again Necator was more vulnerable than Ancylostoma.

R. T. L.

STRONG (W. M.). **Carbon Tetrachloride and Croton Oil in Treatment of Hookworm Infections.** [Correspondence.]—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1926. Mar. 18 & May 20. Vol. 20. Nos. 1 & 2. p. 132. [1 ref.]

Strong administers a quarter to half a minim of croton oil with 30 minims of carbon tetrachloride and has found no ill effects in "many thousands of cases" in Papua. He contrasts the weight of the croton oil with that of the Epsom salts, the quantities for 10,000 cases being less than half a pound of the former and about 480 lbs of the latter. Another advantage is that croton oil can be mixed with carbon tetrachloride in bulk.

T. W. M. C.

SOPER (Fred L.). **Tetrachlorethylene (C_2 Cl_4) in the Treatment of Hookworm Disease.**—*Amer. Jl. Trop. Med.* 1926. Nov. Vol. 6. No. 6. pp. 451–454. [2 refs.]

Soper has treated 13 patients with tetrachlorethylene and another 13 with a mixture of chenopodium and tetrachlorethylene, and finds that carbon tetrachloride alone or with chenopodium is more effective for *Necator*; and with chenopodium, is more effective for *Ancylostoma* than tetrachlorethylene. He concludes that it has no advantage over carbon tetrachloride for *Necator* infections, but that further tests should be made with *Ancylostoma*.

T. W. M. C.

LANE (Clayton). **The Treatment of Ankylostomiasis.**—*Lancet.* 1926. Aug. 14. pp. 346–347.

All anthelmintic treatment is a compromise between efficiency and safety. Of the five lines of treatment in vogue the mixture of chloroform and eucalyptus has produced too much anxiety to be now advocated, at least for mass treatment. The optimum dose of beta-naphthol has been placed at 2 grains, but even in this dosage the blood destruction, which has caused in larger doses (3·6 gr. or less) a number of deaths with haematuria, is evident from an invariable diazo-reaction in the urine. Thymol in optimum dosage of 4 grains has apparently no death indubitably attributable to it. Oil of chenopodium in SCHÜFFNER and VERVOORT's optimum dosage of 1·2 cc. also has a good record, although the error of taking drops as equivalent to minims has led to a number of fatalities. Its active principle, ascaridol, is held by NELSON to comprise 50 to 70 per cent. of the oil. Carbon tetrachloride in its "therapeutic dosage" of 3 cc. has killed a number of persons and doses of 1·5 cc. have caused grave apprehension or unexpected death, the risk (of fatty degeneration and necrosis of viscera) being lessened by glucose ingestion. The author is of opinion that "Thymol, and oil of chenopodium of known ascaridol content, used in respective dosage of 4 g. and 1·2 c. cm., are safe drugs, the latter being, apparently, the more effective where *A. duodenale* is concerned. The choice between the two will mainly be determined by secondary considerations, such as palatability and, under mass conditions, ease and cost of administration."

For the treatment of clinical cases under adequate supervision one or other of the known treatments may suffice ,but the immense problem of hookworm eradication by mass treatment of carriers can only be solved, in the author's view, by the discovery of some drug more specific in its toxicity to hookworm than any now known.] R. T. L.

LANE (Clayton). **Chenopodium for Ankylostomiasis.** [Correspondence.] —*Lancet.* 1926. Sept. 18. p. 624.

Lane points out that the constants in PAGET's paper* on the determination of ascaridol content of oil of chenopodium, are valueless unless applied to the genuine oil as they can easily be reproduced by adulteration. He draws attention to the fact also that the oil of chenopodium of B.W. & Co. has an ascaridol content of 90 per cent. and so 1·2 cc. of this oil is equivalent to 1·8 cc. of an ordinary sample. Accordingly the ordinary dose of this particular oil must be only 0·8 cc. T. W. M. C.

i. BLAJINE (A. N.). Contribution à l'étude l'ankylostomase en Abchasie. [**Ankylostomiasis at Abchasie.**]—*Russian Jl. Trop. Med.* 1926. No. 5. French summary p. 78. [In Russian.]

ii. LINDTROP (G. T.). Notes sur les foyers endémiques d'ankylostomiase en Transcaucasie avec un note court sur les conditions helmintologiques de la population de l'Azerbaidjean. [**Endemic Foci of Ankylostomiasis in Transcaucasus.**]—*Ibid.* French summary p. 78. [In Russian.]

iii. RAMÉRY. Foyer d'ankylostomiase à Menzel-bou Zelfa. [**Focus of Ankylostomiasis at Menzel-bou-Zelfa, Tunis.**]—*Arch. Inst. Pasteur de Tunis.* 1926. June. Vol. 15. No. 2. pp. 154–156.

* *Analyst.* 1926. Vol. 51, p. 170.

iv. MANALANG (Cristobal). **Ankylostomiasis. III. Hookworm Counts and Classification among Hospital Patients.**—*Jl. Philippine Islands Med. Assoc.* 1926. June. Vol. 6. No. 6. pp. 192–196.

v. OGATA (Seiji). [**Studies on the Prevention of the Ancylostomiasis. Communication II. On the Attitudes of the Larvae of the Ancylostomes.**]—*Osaka Igakkwai Zasshi* (*Jl. Osaka Med. Soc.*). 1925. Nov. Vol. 24. No. 11. [Summarized in *Japan Med. World.* 1926. June 15. Vol. 6. No. 6. pp. 152 153.]

i. *Necator americanus* was found for the first time in Abchasie a few years ago, but since then seven other cases have been recorded.

ii. Lindtrop has observed endemic foci of hookworm disease in two districts in western Transcaucasia. The disease has also been observed near Batoum.

iii. Ramery has found, in three cases examined, hookworm eggs, but he considers that further investigations will disclose more infections in this region.

iv. Of nearly 5,000 worms recovered from 136 cases in Zamboanga, 14·5 per cent. only were *Ancylostoma duodenale*, the remainder being *Necator americanus*.

v. Ancylostome larvae do not survive a temperature of 60° C. for 3 seconds, 55° C. for 10 seconds, 50° C. for 3 minutes, 47° C. for 20 minutes, and 45° C. for one hour. The optimum temperature appears to be 30° to 35° C.

T. W. M. C.

i. CASTEX (M. R.) & GREENWAY (D.). Parasitose intestinale. [**Intestinal Parasitism.**]—*C.R. Soc. Biol.* 1926. Dec. 3. Vol. 95. No. 35. pp. 1379–1381.

ii. FUJII (Tamotsu), SAITO (Setsu) & SHIONOYA (Hisashi). [**On the Intestinal Parasites of the Ainus (or the Aboriginal Tribes found in Hokkaido), as they are found by the Fecal Examination.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1926. Apr. No. 2468. [Summarized in *Japan Med. World.* 1926. Aug. 15. Vol. 6. No. 8. pp. 220–221.]

iii. GÉNEVRAY. Parasites intestinaux et coolies indochinois en Nouvelle-Calédonie. [**Intestinal Parasites and Indochinese Coolies in New Caledonia.**]—*Ann. de Méd. et de Pharm. Colon.* 1926. Apr.–May–June. Vol. 24. No. 2. pp. 215–218.

iv. BOISSEAU (R.). Le parasitisme intestinal au Congo français. [**Intestinal Parasitism in French Congo.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 714–718. [4 refs.]

v. GOURFINKELL (M.). Sur la question de l'helminthiase dans les asiles des enfants défectueux du réseau d'Odessa. [**Helminth Infections in Institutes for Defectives at Odessa.**]—*Russian Jl. Trop. Med.* 1926. No. 5. French summary pp. 78–79. [In Russian.]

vi. EGUCHI (Suyewo). [**Some Knowledge on the Mutual Relation among the Parasites of the Wild Beasts, especially Ferocious Species and Man.**]—*Aichi Igakkwai Zasshi* (*Jl. Aichi Med. Soc.*). 1925. Nov. Vol. 32. No. 6. [Summarized in *Japan Med. World.* 1926. Apr. 15. Vol. 6. No. 4. pp. 90–91.]

i. In the Argentine, the following helminths are recorded by the authors: Whipworm (15 cases), *Taenia saginata* (3 cases), and *Hymenolepis nana* (3 cases).

ii. The Ainus or aboriginal inhabitants of Hokkaido do not use excrement as do the Japanese farmers, but they are very primitive in their habits. An examination of 314 showed that only 4 per cent. were free from parasites. Of the remainder 87 per cent. harboured Ascaris, 43 per cent. whipworm, 4 per cent. hookworms, 1·3 per cent. *Trichostrongylus orientalis*, and 3 per cent. Dibothriocephalus.

iii. Intestinal parasites are common in New Caledonia. Of 88 "healthy" persons examined either by means of a faecal smear or by means of the Willis technique, 83 harboured Trichocephalus, 79 *Necator americanus*, 72 Ascaris, and 15 Clonorchis.

iv. The stools of 840 natives from one year old upwards, of the French Congo, were examined for parasites and 81 per cent. were found to harbour hookworms, 68 per cent. whipworms, and 65 per cent. ascaris. None were found uninfested and many contained eggs of all three.

v. Between 60 and 70 per cent. of the children in institutes for the defective in Odessa are infected with helminths—the commonest species being Trichuris, Ascaris, and *Hymenolepis nana*.

vi. Eguchi has found *Clonorchis sinensis* in the camel, *Paragonimus westermanii* in the Malay tiger, and *Sparganum mansoni* and *Dibothriocephalus latus* in the tiger, lion, and panther.

i. BABA (Fusao). [**On the Efficacious Property of the Anthelminthic "Macunin."**]—*Tokyo Igakkwai Zasshi* (*Jl. Tokyo Med. Soc.*). 1926. Mar. Vol. 49. No. 3. [Summarized in *Japan Med. World.* 1926. Oct. 15. Vol. 6. No. 10. pp. 287–288.]

ii. DUMAS (R.). Déparasitation intestinale par le tétrachlorure de carbone. [**Clearance of Intestinal Parasites by Carbon Tetrachloride.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 719–722. [3 refs.]

iii. HEKTOEN (Ludvig). **The Precipitin Reactions of Extracts of Various Animal Parasites.**—*Jl. Infect. Dis.* 1926. Oct. Vol. 39. No. 4. pp. 342–344. [6 refs.]

i. "Macunin," in *in vitro* experiments, was found to have a paralysing effect on the pig Ascaris—a 2 per cent. concentration depriving it of motility in an hour at 37° C.; 10 grains per kilo body weight by subcutaneous injection and twice that amount by oral administration is lethal to rabbits.

ii. Dumas considers that carbon tetrachloride should receive more attention as an anthelmintic on account of the simplicity of treatment, ease of administration, and absence of toxicity.

iii. Precipitin reactions of materials derived from animal parasites follow the general rule of species-specificness. Extension of the study of animal parasites by immunological methods is indicated.

T. W. M. C.

ABELARDO LARA (N.). Algunos puntos de patologia tropical. Ankilostomiasis. Anguilulosis. Niguas. Avicularia. Tokelau.—*Rev. Méd. de Yucatàn.* 1926. June. Vol. 14. No. 1. pp. 6–12.

BRACHETTO-BRIAN (D.). Coloración de microfilarias por el procedimiento de Jiménez de Asúa.—*Semana Méd.* 1926. June 17. Vol. 33. No. 24. (1692). pp. 1333–1334. With 1 text fig. [1 ref.]

BRADLEY (Burton). Notes on Larval Trematodes from New South Wales.—*Med. Jl. Australia.* 1926. Oct. 30. 13th Year. Vol. 2. No. 18. pp. 573–578. With 14 figs. on 1 plate. [17 refs.]

BRAILSFORD (James F.). Man as the Intermediate Host of the *Taenia Solium.* [Correspondence.]—*Brit. Med. Jl.* 1926. Sept. 25. p. 579.

LEON (N.). Sur la bifurcation du *Dibothriocephalus latus.*—*Ann. Parasit. Humaine et Comparée.* 1926. July 1. Vol. 4. No. 3. pp. 236–240. With 2 text figs. [7 refs.]

SCHOPFER (William H.). Recherches physico-chimiques sur les liquides de parasites. (Ascaris) II.—*Parasitology.* 1926. Sept. Vol. 18. No. 3. pp. 277–282. With 5 charts. [4 refs.]

TSUCHIMOCHI (Katsuji). On Larval Flukes infesting *Limnaea* in Formosa.—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. Aug. No. 257. English summary pp. 1–4. [In Japanese. With 15 figs. on plates.]

LEPROSY.

ABBATUCCI (S.). La lèpre dans les colonies françaises; sa prophylaxie et son traitement. [**Leprosy in the French Colonies; Prophylaxis and Treatment.**] *Presse Méd.* 1926. Sept. 8. Vol. 34. No. 72. pp. 1147–1148. [2 refs.]

The first part of this paper gives the same data regarding the prevalence of leprosy in French colonies as were dealt with in this *Bulletin* Vol. 23. pp. 836. Part II deals with prophylaxis in France, where 194 lepers have been treated in the hospital Saint-Louis between 1919 and 1923. Nearly 200 are believed to exist in Paris, but no laws exist under which they can be controlled.

L. Rogers.

MONTPELLIER (J.) & PINELLI (A.). La lèpre chez les indigènes de l'Algérie. [**Leprosy in Algerian Natives.**]—*Rev. Prat. Malad. des Pays Chauds.* 1926. June. Year 5. Vol. 6. No. 4. pp. 217–225. With 1 map. [2 refs.]

The authors give a table of 27 indigenous cases of leprosy in Algeria, including 14 nodular and 3 mixed of infective types; a focus of infection exists in the centre of the country in the Kabyle area.

L. R.

UCHIDA (Shigeo). [**A Statistical Study on Leprosy in Okayama Prefecture.**] —*Hifuka Hitsunyokika Zasshi (Jl. Dermat. & Urol.).* 1926. Jan. Vol. 26. No. 1. [Summarized in *Japan Med. World.* 1926. Sept. 15. Vol. 6. No. 9. pp. 255–256.]

Among 40,527 out-patients at the Okayama hospital the writer found 320, or 0·78 per cent., to be lepers; 70 per cent. were males. 50·7 per cent. of the cases were macular, 29·7 per cent. nerve, 13·4 per cent. nodular, and 5·9 per cent. mixed; the ages varied from 10 to 82.

L. R.

WILSON (R. M.). **Leprosy in Korea.** *Jl. Amer. Med. Assoc.* 1926. Oct. 9. Vol. 87. No. 15. pp. 1211–1212. With 3 text figs. [1 ref.]

The author has studied 938 lepers in the colonies at Kwanju and Fusan, and states that the number in Korea has been variously estimated at from 5,000 to 20,000. The average duration on admission of the cases was 3·3 years. He has been using Muir's method in injecting pure Ol. Hydnocarpus wightiana with 1 per cent. camphor, which is much cheaper than the esters, in 4 to 8 cc. doses weekly, while at Fusan the esters were used with such satisfactory results that 238 patients have now been parolled and a further number will soon be sent out. He continues: "We have seen apparent cures in 30 per cent. in spite of the fact that many of our cases have come in the advanced stages." Further, over 75 per cent. had the disease arrested so that they could do active work, which he agrees with MUIR is an important element in the treatment.

L. R.

TOURNIER. La lèpre à Canton. [**Leprosy at Canton.**] -*Ann. de Méd. et de Pharm. Colon.* 1926. July–Aug.–Sept. Vol. 24. No. 3. pp. 362–369.

Canton alone is estimated to have 20,000 lepers. The Chinese believe the disease to be hereditary and also contagious essentially through sexual intercourse, and hold the peculiar view that a leper can be cured of his disease by having sexual intercourse ten times with healthy persons. Female lepers are led to prostitute themselves and males to commit rape, often on young children. The incubation period after infection through sexual intercourse is 100 days, during which the patient is infectious. Another method of cure is to disinter a recently buried infant and make a meal of the lower extremities. As Southern China is terribly afflicted with leprosy, these methods do not appear to be very effective.

A leprosorium has been founded on two islands near Sheklung by Catholic priests, one for males and one for females, with 3,173 admissions between September 26th 1913 and 1st January 1925. The local government gives a capitation grant toward the cost.

L. R.

RANGEL (Mario). A prophylaxia da lepra no Brasil. O Lazaropolis do Prata no Pará. [**The Prophylaxis of Leprosy in Brazil. The Lazaropolis in Prata, Pará.**] *Rev. Med.-Cirurg. do Brasil.* 1926. Nov. Vol. 34. No. 11. pp. 442–445.

The first agricultural leper-colony in Brazil was opened at Prata in June, 1924, and this paper gives a brief account of its working. 600 patients were chosen from a list of 2,200 registered cases. The selection was made in accordance with the following main ideas :—

1. Adult lepers of both sexes, who were sufficiently healthy to work and were qualified to do official duties or give instruction.
2. Lepers, of any age or sex, needing segregation and protection.
3. Those whose pathological condition or habits rendered them dangerous to the community.
4. Such as were likely to benefit by modern methods of treatment.
5. Well-to-do lepers who might wish to come in at their own expense.

The last lived separately. The poorer patients were divided into three classes : those under 14 years of age, lodged in separate pavilions, according to sex and state of health ; adults in fair condition, distributed in pavilions or houses on agricultural allotments and doing work graded to their capabilities ; those adults who were too ill to work.

The medical personnel consisted of two consultants and two nurses, one for males and one for females ; those patients unable to attend the consulting-rooms were visited at regular intervals. A time-table was arranged as regards meals, work, rest, recreation, etc. The farm was under the control of an agriculturist, with two subordinate overseers and twenty assistants (healthy) who directed the work of the patients. Different areas were given to the cultivation of millet, rice, cotton, plantations of pumpkins, etc.

The internal domestic arrangements were of a lenient order. The indigent leper was allowed to live with his wife, the cost of maintenance being borne by the State ; the well-to-do had his wife or some person

responsible for his treatment, the expense being paid by the patient. Children free from leprosy, under five years of age, lived in a crèche or an adjoining orphanage.

All patients, well-to-do or poor, wore uniform. To avoid the circulation of paper-money, copper discs stamped with numbers 1 to 100 were used and periodically disinfected in an autoclave. Letters were posted in a special box and sterilized in an autoclave before being sent out.

The results appear so far to be very satisfactory and the patients happy and contented.

H. Harold Scott.

PUPO (Aguiar). Alguns trechos de uma conferencia sobre a lepra no Brasil. [**Jottings from the Conference on Leprosy in Brazil.**]—*Rev. Méd.-Cirurg do Brasil.* 1926. Nov. Vol. 34. No. 11. pp. 445–446.

According to official returns of the Department of Hygiene, Brazil has an endemic index of leprosy of 0·8 per mille. In the northern parts, Maranhão, Pará, and Amazonas, there are 3,165 cases among a population of 2,221,000, or 1·4 per 1,000. In the capital of Pará, in 1922, the index was as high as 4 per 1,000, and in Minas, the richest and most populous of the Brazilian States, there are 10 12,000 lepers amongst a population of under 6,000,000, an incidence of 2 per mille.

With an increasing number of children and adolescents, there is an expectation of doubling this figure in the course of the next ten years. The remainder of the paper is devoted to the statistics of Norway and other places, in part culled from the records of ROGERS and MUIR.

H. H. S.

BALIÑA (Pedro L.) Lepra autóctona de la ciudad de Buenos Aires: Prophylaxis. [**Indigenous Leprosy in Buenos Aires: Prevention.**]—*Semana Méd.* 1926. Dec. 9. Vol. 33. No. 49. (1717). pp. 1552–1557. With 3 text figs.

In the twelve years prior to 1921 the author personally attended 142 cases of leprosy in the city of Buenos Aires, of which 14 were autochthonous. In the succeeding 5 years he attended 137 more, of which 20 were autochthonous. In other words, the total has increased by more than 100 per cent., and the autochthonous by more than 200 per cent. Three recent patients are particularized, namely a married couple aged 74 and 73 years and their daughter, living about 100 metres from the Muñiz Leper Asylum. These cases are employed by the author to point a moral and adorn a tale. Apparently, there is a proposal to add another wing to the Muñiz Hospital, and the author having visited the home of the three lepers and finding swarms of flies, concludes that these insects have conveyed the disease from the hospital to his patients. "The prophylaxis of leprosy" he states "is impracticable in a city in which 200 lepers are confined. Rational treatment is impossible in urban asylums. Humanitarian reasons, apart from those of prophylaxis and treatment, should have them set free from the prison in which the lepers of Muñiz Hospital have to spend their lives and sent as soon as possible to the farm-colonies which the law demands to be established in accordance with general experience."

H. H. S.

PUENTE (José J.). Consideraciones sobre una estadística levantada entre los leprosos del hospital Muñiz. [**Statistics of Lepers at the Hospital Muñiz.** *Semana Méd.* 1926. Dec. 9. Vol. 33. No. 49 (1717). pp. 1557–1560. With 1 map in text.

The figures given refer to cases since July, 1925. A total of 209 has been seen, 164 males, 45 females. 21 of these (10 per cent.) were imported.

The districts whence 142 of the patients came are recorded, the chief of which are Santa Fe (46), Buenos Aires (24), Entre Rios (24), Corrientes (17), Córdoba (7), and Tucumán (6). As regards age, 10 per cent. were under ten years, 35 per cent. in the second decade, 25 per cent. in the third, after which there is a drop to 8 per cent. A sketch spot-map is given indicating the places whence the lepers came to the hospital at Muñiz.

H. H. S.

VAN ANDEL (M. A.). Contribution à l'iconographie de la lèpre. **Representations of Leprosy.** —*Janus.* 1926. July–Aug. Vol. 30. No. 4. pp. 192–194. With 2 figs. on 1 plate. [4 refs.]

The writer illustrates an architectural sculpture of the door of an old leprosarium at Gouda, Holland, which has a figure of a leper.

L. R.

MOLESWORTH (E. H.) **The Leprosy Problem.** —*Med. Jl. Australia.* 1926. Sept. 18. 13th year. Vol. 2. No. 12. pp. 365–381. With 2 text figs. [17 refs.]

This lengthy paper advocates the abandonment of compulsory segregation in Australia and criticizes the views in ROGERS and MUIR'S book on leprosy regarding the value of this prophylactic measure. The writer holds that Europeans have more resisting power against infection than natives, and that in the dry temperate climate of most of the continent the danger of infection is too slight to justify compulsory segregation; although it only applies to bacteriologically positive cases segregation leads to hiding and avoidance of treatment in the early stages, notwithstanding treatment of a more hopeful nature is now available. He goes on to illustrate the difficulty in finding lepra bacilli in early and in some more advanced cases, and he refers to early work of Dr. G. H. TAYLOR in Sydney, who recorded in the *Australian Medical Gazette* of January 20th, 1896, examinations of large numbers of hospital attendances and discovered a number of early nerve cases. He verified three post mortem by finding lepra bacilli, but he was transferred to railway work on account of breach of discipline for not reporting his results officially. An account of the New South Wales Lazaret is given, where the author "was not at all satisfied that either the best methods and drugs were being used or that the best results were being realized." Chaulmoogra oil orally was largely relied on, while at the Peel Island settlement there is no resident medical officer and the treatment is largely routine.

L. R.

COCHRANE (Robt. G.). **Final Report on the Medical Work of the Mission to Lepers in India (including Burma).**—12 pp. With 1 map. London: The Mission to Lepers, 33 Henrietta St., W.C.2.

As the result of a prolonged tour in India, visiting the asylums, the location of which is well shown in the map, the writer strongly advocates the transformation of one of the larger and better leper institutions in each province into a sanatorium for the admission only of cases suitable for treatment; an adequate medical staff should allow of the best treatment being provided under favourable conditions, and the smaller institutions should be retained as asylums for the crippled chronic nerve cases unamenable to treatment. The new institutions will then be essentially hospitals for treating the earlier more amenable cases, whom they will attract, and arrest their disease before others have been infected; six or seven medical men will be required. "With this new outlook, the possibility of arresting the disease and finally stamping it out is slowly coming into sight," although it will take many decades if not centuries in India, on account of the great difficulties. Out-door dispensaries for treatment of early uninfective cases should be increased. A useful summary of the number of institutions and leper inmates in each province is appended.

L. R.

HOFFMANN (W. H.) & RAMOS BÁEZ (Pedro). Nuevas orientaciones sanitarias y terapeuticas sobre la lepra. [**New Ideas on Leprosy, from the Points of View of Hygiene and Therapy.**]—*Med. Argentina.* Buenos Aires. 1926. June. Vol. 5. No. 49. pp. 52–59.

In the early stages of the disease leprosy is as readily curable as syphilis or malaria by proper treatment. A patient, after injections of chaulmoogra, exhibited Herxheimer's reaction, showing that the theory of toxin-liberation is applicable to leprosy as to other diseases. Professer Hoffmann thinks that infection takes place by penetration of the skin of the hands and feet, and that the nasal localization of the bacilli occurs in the secondary stage. As regards treatment, one patient improved much on an antimonial preparation, Stibosan, and the authors suggest that it or some such drug be used in combination with chaulmoogra.

To deal properly with the disease in Cuba, the following measures are suggested:—

1. To obtain accurate statistics of prevalence and to look for cases in an early stage among the families and friends of those obviously infected. 2. Obligatory intensive treatment of early cases. 3. Compulsory isolation of all patients showing mutilation. 4. Isolation of the infected, either at home, if this can be carried out satisfactorily, or in hospital. 5. Prohibition of lepers from following certain occupations. 6. Separation and care of the children. 7. Establishment of centres with a man experienced in the disease at the head, for advice, diagnosis and treatment, and trained inspectors to search out early cases and ensure that no advanced cases are at large.

H. Harold Scott.

RODRIGUEZ (José N.). **Studies on Early Leprosy in Children of Lepers.** —*Philippine Jl. Sci.* 1926. Oct. Vol. 31. No. 2. pp. 115–144. With 1 text fig. & 3 plates. [19 refs.]

This valuable paper gives very important data worked out from many cases in the great Culion settlement of the Philippines, and it brings up to date the former study of 308 children by GOMEZ, and others. The number now dealt with is 398 at Culion at the close of 1924 out of 871 born in the colony since May, 1906, 398 having died and 75 having been sent away as non-lepers. Of those remaining 59, or 14·8 per cent. were or had been positive lepers., 11 or 2·8 per cent. were clinical lepers, 97 or 24·4 per cent. were suspicious and 231 or 58 per cent. were negative ; thus, 42 per cent. either were lepers or had symptoms suspicious of the disease. The sex incidence was very similar, but the age incidence showed a great rise between 10 and 16 years, attributed to puberty lessening the resisting powers. Fifty per cent. of the confirmed lepers became positive between the ages of 3 and 6 years, the average being 5 year 9 months. There was no evidence of hereditary leprosy, and the possibility of an hereditary predisposition has been very carefully studied, but no conclusive evidence either way could be obtained, so that if it occurs at all it must play a very minor rôle in disseminating leprosy.

Placental transmission is next considered, acid-fast bacilli having been found in 4 of 15 placentas examined. E. V. PINEDA with improved technique is reported to have found them more frequently, yet all the evidence is against congenital infection. CURIE found only 14 claims for its occurrence in 25 years literature up to 1915, and no congenital case of leprosy was seen or reported in the 871 children born at Culion up to 1924. The writer has, however, seen suspicious lesions in six children of 3 to 6 months, in three of whom they became positive between the second and third years, so very early infection may occur, although the evidence is against congenital weakness due to leprosy in parents. Of 184 mothers treated during pregnancy, and 58 untreated, in each 50 per cent. of the offspring remained free from definite or suspicious leprosy, so no reduction in the incidence resulted from treating the expectant mothers.

The factors influencing transmission during infancy and early childhood are next considered. Of breast-fed infants only 11·6 per cent. became leprous against 16·9 per cent. with mixed feeding and 24 per cent. of bottle-fed children, indicating once more that badly nourished children are more liable, and that the mother's milk cannot be an important source of infection. In 3 cases, the portal of entry was evidently a scabies itch, but skin diseases as a whole did not predispose to infection. Former evidence showing more frequent infection from leper mothers than from fathers, owing to closer contact of the child with its mother, is confirmed, as well as the greater infectivity of cutaneous and mixed types than of nerve ones.

The initial or primary lesion was found in no less than 85 per cent. of the children who became decidedly leprous, as a single cutaneous lesion, but in the remaining 15 per cent., a generalized rash or multiple macules appeared simultaneously. The initial lesion appeared on the buttocks in 28·8 per cent., on the cheeks in 11·8, on the loins in 6·7, scapular region 1·7, arms 10·2 and legs 15·3 per cent. out of 45 cases, but they were never seen on the chest or abdomen. They consist of a pale macule most frequently, or may be pink macules or anaesthetic patches.

The effect of delayed segregation of the children of lepers is next considered, and the important conclusion is come to that the segregation of the children of lepers after the age of six months does not decrease the incidence of leprosy among them, nor does it delay the appearance of the disease, so that it is clearly imperative to remove them as soon as possible after birth from infection by their parents, as has been done successfully in Hawaii and India. Indeed, there was a higher leprosy ratio in those segregated after 6 months than in the unsegregated, attributable to infection having already taken place in the former, while the appearance of the disease was retarded by the better nourishment of those remaining with their parents. Of the children segregated from their parents at an average age of 3 years and 6 months 23 per cent. have become leprous.

The probable average period of incubation in both the segregated and the unsegregated children was 3 years and nine months, the younger children being more susceptible than the older ones, and the average age at infection is estimated to be two years. An observation period of children segregated from infected parents after the age of six months should be at least five years before they can be considered as probably free from infection and safe to mix with healthy children.

L. R.

HOPKINS (Ralph). **Leprosy with Special Reference to Self-Limiting Phases of the Disease.** *Southern Med. Jl.* 1926. Nov. Vol. 19. No. 11. pp. 784–790.

Observation of many cases for a long time cannot fail to impress the tendency of leprosy in some of its phases to be a self-limiting disease, although the time required is very variable, and this indicates an elaboration in the host of a protective mechanism against Hansen's bacillus; the occurrence may be either spontaneous or due to treatment. Acute manifestations occurring from time to time were found by the writer to respond to Fowler's arsenical solution and quinine, which he believes to be valuable in this phase; the erythematous nodules which appear show very few lepra bacilli, being probably toxic in nature and tend to clear up again of themselves, while in the nerve form acute exacerbations of pain may occur. Such reactions may be produced by iodides, chaulmoogra oil injections, smallpox vaccine, anthrax or leprous vaccines, and in one case leech extract, etc., and may result in the destruction of myriads of lepra bacilli, followed by improvement in the lesions or their disappearance. He agrees with other observers that death is often due to intercurrent affections.

L. R.

TEBBUTT (A. H.). **Tuberculoid Leprosy.** *Med. Jl. Australia.* 1926. Sept. 18. 13th year. Vol. 2. No. 12. pp. 381–386. With 12 figs. on 2 plates. [14 refs.]

The writer illustrates sections from leprous lesions showing giant cells very similar to those of tubercle, and is in agreement with German, rather than with other writers, in regarding them as leprous in nature, and not tubercle complications. He points out the danger of overlooking leprosy if this is not recognized.

L. R.

HAMILTON (George R.). **Leprosy acquired in a Lazaret.**—*Med. Jl. Australia.* 1926. Sept. 25. 13th year. Vol. 2. No. 13. pp. 420–422. With 2 text figs.

A white attendant at a lazaret and in close association with and friendly with some of the patients cut his left hand 13 years before manifesting signs of leprosy, which commenced with a reddish macule near the scar one inch in diameter.

L. R.

COCHRANE (Robert G.). **Nerve Enlargement in Leprosy.** [Memoranda.]—*Brit. Med. Jl.* 1926. Aug. 21. p. 343.

The writer in a letter narrates two cases of enlargement of the ulnar nerve and one of the great auricular nerve in the neck, the latter case not having been recognized at first as one of leprosy.

L. R.

i. LITTLE (E. Graham). **Acute Nodular Leprosy originating in this Country and Cured by Vaccine Treatment.**—*Brit. Med. Jl.* 1926. Dec. 4. pp. 1034–1035. With 3 figs. on special plate.

ii. LOW (George C.); MACLEOD (J. M. H.); MANSON-BAHR (P.); SEQUEIRA (J. H.).—*Ibid.* 1926. Dec. 11. p. 1141; iii. LITTLE (E. Graham); iv. DAVIES (J. H. T.); v. ROGERS (Leonard).—*Ibid.* Dec. 18. pp. 1195–1196; vi. LITTLE (E. Graham); vii. HASSON (J.).—*Ibid.* 1927. Jan. 1. p. 40. **Leprosy: its Transmission and Treatment.** [Correspondence.]

viii. LITTLE (E. G. Graham). **Case of Nodular Leprosy, previously shown; Improved under Treatment.**—*Proc. Roy. Soc. Med.* (Sect. of Dermat., pp. 30–31). 1926. Dec. Vol. 20. No. 2. pp. 100–101. [1 ref.]

i. A case of old standing leprosy in a Chinaman six months in this country showed an acute exacerbation of the disease in the form of an eruption of nodules, which disappeared under treatment with J. Hasson's vaccine and is reported as "cured" by this treatment. As pointed out by E. MUIR and others, such acute eruptions often clear up without any treatment whatever.

ii. The writers point out that the case neither originated in this country nor can be considered as "cured."

iii. Dr. Little acknowledges the truth of the contentions in the last noted letter and calls the case "cured as far as clinical and bacteriological evidence goes."

iv. This letter reports improvement in a case of leprosy on Hasson's vaccine, and says chaulmoogra oil preparations have proved useless in this country. [This is not the reviewer's experience.]

v. The writer quotes Dr. Little's statement that "it is the general experience" that chaulmoogra oil preparations have not fulfilled the expectations aroused by the writer, and asks if he is ignorant of the hundreds of successfully treated cases in the tropics, or if he thinks the few failures in this country outweigh the hundreds of successes in the hands of men with far larger experience than it is possible to obtain in this country?

vi. Dr. Little replies that he relied on his opportunities as editor of the Skin Diseases Section of the Tropical Diseases Bureau for his view

of the uselessness of the chaulmoogra oil preparations. [The leprosy reviews do not appear to have been written by him since the improved treatments were commenced in 1915.]*

vii. J. Hasson maintains that his vaccine treatment is not a modification of former ones.

viii. This appears to be the same case as in i.

L. R.

SERRA (Alberto). Ricerche biologiche sull'infezione leprosa. Etiopatogenesi e linfoghiandole. III nota. **Biological Researches on Leprosy; Pathogeny and Glandular Infection.** *Giorn. Ital. di Dermat. e Sifil.* 1926. Aug. Vol. 67. Year 61. No. 4. pp. 1109–1129. With 2 folding tables & 2 plates. [26 refs.]

Following up his previous communications on gland-involvement in leprosy, the author here goes more deeply into the question. This adenitis occurs in the following order of frequency:—inguinal, femoral, submaxillary, axillary, cervical and epitrochlear. It is an early sign; the glands are ovoid, varying in size from a bean to an egg, are hard, mobile, and indolent, and easily distinguishable from enlargements due to tuberculosis or syphilis. In a detailed table dealing with 33 patients he shows that in 4 cases of anaesthetic and 4 of the mixed form, examination of the gland-juice and the gland-pulp revealed lepra bacilli, although none were found in the blood or nasal mucus. In fact, only three had the bacilli in the peripheral blood.

Histological examination was made of glands in two cases during life and in 8 after death. Even when no change could be discovered by the unaided eye, there was microscopical evidence in the form of small fibrous nodules and necrotic foci with bacilli present. The deep glands presenting the most marked lesions were the bronchial and mesenteric, in a less degree the pre-lumbar and those at the portal fissure.

In a second table 12 subjects are considered from the point of view of their possible contact with leprous cases, often members of their family being affected, or they themselves being in attendance on patients. All 12 had enlarged glands and from each the bacillus was obtained, though only one had the organism in the nasal mucus. From three others it was found in the mucus after the administration of potassium iodide. By keeping some of these under observation for a long period the author was able to note the definite appearance of symptoms as the disease declared itself. In one case symptoms did not appear till seven years after the first examination when bacilli were found in the gland-juice.

The author, speaking of the pathogeny of leprosy on the basis of his researches, concludes that there is an analogy between leprosy in man and in rats, in that in the latter also the bacilli may for a long time (perhaps for life) be present in the glands without setting up a general infection. The importance of the recognition of the local infection in early stages is great for prophylaxis and for hopes of cure by treatment.

H. Harold Scott.

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* In truth the Leprosy reviews have never been written by Dr. Little. Doubtless when he was sectional Editor for Skin Diseases (1917–1922) he studied the Leprosy section of the *Bulletin*.

COCHRANE (R. G.) **Leprosy, with Special Reference to Prognosis.**—*Jl. Roy. Army Med. Corps.* 1926. Dec. Vol. 47. No. 6. pp. 423–429. [4 refs.]

After a brief general description of early leprosy, it is pointed out that few lepers die of the disease, which tends to become arrested, and in the majority of early cases this should result from treatment without any resulting deformity. "The outlook for the early skin leper is very much more hopeful than it was six years ago, because of the advance in knowledge and treatment." After all active signs are lost treatment should be continued for six months, and the patient should be examined for relapse every 3–6 months for five years.

L. R.

PINEDA (Eloy V.) & ROXAS-PINEDA (Elisa). Studies on the Serology of Leprosy, III. **The Kahn Precipitation Reaction in Leprosy.**—*Philippine Jl. Sci.* 1926. July. Vol. 30. No. 3. pp. 295–302. [17 refs.]

The sera from 250 cases of leprosy were tested by the Kahn precipitation test; 36 were positive in some degree, 28 of whom were also clinically positive for syphilis or yaws, and treatment of 14 produced negative reactions in 12 and lessened the reaction in 2. 54 cases with lepra reaction all gave negative results, although it is in these that a positive Wassermann is most often obtained. The author therefore concludes that the Kahn precipitation test is negative in uncomplicated cases of leprosy, even when lepra reaction is present, so is preferable to the Wassermann test in detecting treponematous infections in lepers. It also has the same value as the latter test in yaws.

L. R.

ARGÜELLES (M. V.). **The Kahn Test in Leprosy.**—*Philippine Jl. Sci.* 1926. July. Vol. 30. No. 3. pp. 275–286. [13 refs.]

Summary and Conclusions.

"1. One hundred non-leper sera, obtained from the venereal clinic and out-patient department of San Lazaro Hospital, were examined for the Wassermann and the Kahn tests. There was an agreement in the results of 93 per cent.

"2. One hundred leper and leper-suspect sera were tested by the Wassermann reaction and by the precipitation test of Kahn.

"3. There was very close agreement in the results of the Wassermann and the Kahn tests with a slight sensitiveness in favour of the Kahn test.

"4. The Wassermann and the Kahn tests in leper patients are generally negative.

"5. There was observed, in 1 per cent. of leper and leper-suspect sera, positive Wassermann reaction without any history or signs of syphilis or yaws. In confirmed leper sera, the Wassermann test was positive in 1·23 per cent. of the cases without any signs or history of syphilis or yaws. Kolmer and Denney found that 7·32 per cent. of non-syphilitic leper sera gave falsely positive Wassermann reaction.

"6. The Kahn test was positive in 5 per cent. of leper and leper-suspect sera without any signs or history of syphilis or yaws. In confirmed-leper sera, the Kahn test was positive in 6·17 per cent. of the cases without any sign or history of syphilis or yaws.

"7. As far as lepers are concerned, the Kahn test is of greater value than the Wassermann test in excluding syphilis or yaws, and of less value in establishing the diagnosis of these two diseases."

L. R.

RUBINO (Miguel C.). Una nueva reacción serológica de la lepra. (Communicación leida en la Sociedad de Dermatologia y Sifiligrafia de Montevideo). [**A New Serological Reaction in Leprosy.**] —*Rev. Hig. y Sanidad Pecuarias.* 1926. Nov. Vol. 16. No. 11. pp. 772–777.

For this test the author prepares a suspension of sheep's corpuscles in the following way. The corpuscles are well washed with normal saline and made up to the original volume by the addition of 10 per cent. formalin. After 24 hours at room temperature, the corpuscles are repeatedly washed with normal saline, four times at least, and the product finally again brought to the original volume by adding saline, and a uniform emulsion is made.

One cc. of inactivated serum is mixed with an equal volume of the corpuscle suspension, shaken up and placed in the thermostat at 37° C. for an hour. In the case of a normal serum at the end of this time there is a dense suspension and, after some hours, a certain degree of sedimentation of red cells with an upper well-defined limit, and the surface layer quite clear.

With a leprous serum, in less than the hour, sometimes within a few minutes of being placed at 37° C., there is a fine flocculent suspension which increases in amount and falls to the bottom, leaving the supernatant fluid clear. Soon there is a dark layer of sedimented red corpuscles with a more or less completely clear layer of serum above it. The reaction takes place if to 1 cc. of the corpuscle suspension only 0·125 cc. of serum is added, but the best results are obtained with 0·5—1 cc.

No such result is given with non-formalized corpuscles, sheep or human, and the conclusion is drawn that the reaction is an "agglutinin-sedimentation" one, a quality imparted by formalizing the red cells.

Of 18 cases so tested, 12 were positive and 6 negative. In 3 the diagnosis was doubtful clinically and 2 of these proved positive. In 4 others which were diagnosed clinically as leprosy the result was negative.

713 sera from patients other than cases of leprosy were tested and positive results were "very rare" [the number is not stated], and even in these it was less distinct than in true cases of leprosy.

H. H. S.

LANDEIRO (Fausto). La vitesse de sédimentation des hématies chez les lépreux. [**Velocity of Sedimentation of Red Cells in Lepers.**] —*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. p. 1261. [2 refs.]

The writer confirms the observations of PALDROCK that in leprosy sedimentation of the red corpuscles occurs especially quickly, and finds this most marked in nodular and least in nerve cases, mixed cases being intermediate.

L. R.

BARGEHR (P.). Spezifische Hautreaktionen bei Lepra. [**Specific Skin Reactions in Leprosy.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. June 28. Vol. 47. No. 6. pp. 529–531. [1 ref.]

The following facts emerge from the author's experiments :—

(1) In people who have never come into contact with leprosy, inoculations with fresh, unaltered leproma substance produce a negative reaction.

(2) In persons who show no sign of existing leprosy, but have been for a long time in contact with lepers, a positive reaction occurs.

(3) In persons with active leprosy a negative reaction, but in very slight cases it may be positive.

(4) In lepers in whom after a long course the disease has been in a stationary condition for years without any active symptoms of leprosy, there is often a positive reaction.

These facts allow the following conclusions to be drawn :—

(1) Persons who have not come into contact with lepra bacilli have no specific protective substances.

(2) In persons who come much into contact with lepers there generally occurs a subliminal infection and formation of specific antibodies which produce immunity.

(3) In the case of existing leprosy the antibody is not formed in sufficient quantity to overcome the disease.

(4) Leprosy may often in the course of years be cured, as already pointed out by E. MUIR, presumably in consequence of a senile weakness of the bacillary strain.

L. R.

ENGEL-BEY (Fr.). Zur Therapie der Lepra. [**Treatment of Leprosy.**] —*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Vol. 30. No. 2. pp. 1–60. [64 refs.]

This paper gives a useful survey of the literature concerning the improved treatment of leprosy during the past few years, but contains very little original matter. As might be expected, it is largely an assertion of the value of the German preparation antileprol, although the author's claim that it is mainly used all over the world is quite untrue as regards the extensive tropical possessions of both England and France. He is in agreement with other writers that the ethyl esters of chaulmoogra oil are not a certain cure for advanced cases, and in urging the necessity of diagnosing and treating early cases. Treatment should be begun as soon as clincial signs manifest themselves without waiting for bacteria to be present. Such cases need not be segregated. Isolation has proved an unsatisfactory method of control by itself ; the people of infected areas know the early stages and will come forward for treatment if not compulsorily segregated, while voluntary leprosaria should be supplied to furnish the best treatment ; some patients, however, will not continue the treatment long enough for a complete cure. He advocates injections being given only once a

week and the dose gradually raised, and unirritating preparations should be used, the ethyl esters being preferred by him.

L. R.

HERRERA-BATTEKE (P. P.) & WEST (Augustus P.). **Esters of Chaulmoogric Acid (Capryl, Allyl, Phenyl, Ortho Cresol, Meta Cresol, Para Cresol).**—*Philippine Jl. Sci.* 1926. Oct. Vol. 31. No. 2. pp. 161–168. [9 refs.]

The writers open with the statement that "The treatment of leprosy by means of the mixed ethyl esters obtained from the fatty acids of chaulmoogra oil has given excellent results." As, however, it is slow, it is desirable to prepare other chaulmoogra derivatives, which may, perhaps, have greater therapeutic value than the mixed chaulmoogra ethyl esters. After referring to the earlier work of POWER and more recently that of PERKINS in preparing propyl, butyl and amyl esters of the mixed chaulmoogra acids (which were not found at Culion to have any material advantages over the ethyl esters), the writers describe the highly technical processes by means of which they have prepared the capryl and allyl esters of chaulmoogric acid with capryl and allyl alcohols, respectively, in the presence of hydrogen and choline gas. Further the phenyl, ortho, cresol, and para cresol esters of chaulmoogric acid were prepared by treating chaulmoogric acid with the proper phenyl compound in the presence of phosphorus oxychloride. By work on such lines it is to be hoped that further material advances in the treatment of leprosy will eventually accrue.

L. R.

MUIR (E.). **The Treatment of Wassermann-Positive Cases of Leprosy by a New Oil-Soluble Mercury Preparation.** *Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 291–292.

As a number of leprosy patients with a positive Wassermann improve rapidly on antisyphilitic treatment a combined treatment for both affections is desirable, and it appears to have been obtained in a new mercury preparation made by Dr. T. A. HENRY, of the Wellcome Research Laboratories, the chemical name of which is 2-myristoxymercuri-3-hydroxybenzaldehyde, or for convenience "Hg. 33." It is easily soluble to the extent of 0·25 per cent. in hydnocarpus oil and is only slightly more irritating subcutaneously than the oil alone. A table is given of 30 cases with Wassermann reaction treated in Calcutta, with almost invariable improvement, but most marked in those whose Wassermann reaction became negative, although no effect had been produced on the reaction by long previous courses of hydnocarpus oil alone. Before the combined treatment, 17 showed strongly positive and 13 moderately positive reactions: after the course, 8 were still strongly and 4 moderately positive, 2 doubtful, while 16 were negative, after one course of 15 injections in 10, and 2 to 4 such courses in the other 6. Its non-toxicity and ease of administration in hydnocarpus oil render it a safe and effective remedy in Wassermann positive lepers, while the cases remaining positive after the treatment still remained so after one or two courses of novarsenobillon; this indicates that it is at least as effective as the older remedy and it has the great advantage of being much safer to use in leprosy.

L. R.

LORTAT-JACOB & MORLAAS. Sur un cas de lèpre mixte traité par la cryothérapie. [**A Case of Mixed Leprosy treated by Cryotherapy.**] —*Bull. Soc. Française Dermat. et Syph.* 1926. July. No. 7. pp. 474–475.

An early case with believed long incubation showing lepromes on the face and extremities and lepra bacilli in the nasal mucus was treated with 3 applications of carbonic snow in addition to 4 grammes of novarsenobillon and 30 cc. of chaulmoogra oil, with promising results.

L. R.

PALMER (F. J.). **The Years Between. A Medical Retrospect.** —*Proc. Assam Branch Brit. Med. Assoc. Annual Meeting, Silchar, 1st & 2nd March, 1926.* pp. 25–32.

Some further remarks on the use of copper preparations in leprosy are recorded. Copper citrate is given orally in one grain pills morning and evening for 7 to 10 days with a similar period of remission, or weekly injections of 1½ to 2 grains of copper citrate after a previous course of 4 injections of 3 to 4 grains of bismuth sodium tartrate. Reactions followed by improvement may result and in some early cases the lesions have cleared up, but progress is slow and uncertain in more advanced ones.

L. R.

COELHO (Joao G.). Le *Carpotroche brasiliensis* dans le traitement de la lèpre. [*C. brasiliensis* **in the Treatment of Leprosy.**] —*Presse Méd.* 1926. Oct. 27. Vol. 34. No. 86. pp. 1357–1358. [3 refs.]

This tree grows abundantly in Brazil, and belongs to the same family as *Taraktogenos Kurzii*: it grows to a height of 50 feet, and its seeds yield an oil long used in indigenous medicine for skin diseases including leprosy. From it T. PECKOLT in 1869 isolated a crystalline substance, carpotrochin and an "acide carpotrochinique," and recommended it in the place of the more expensive chaulmoogra oil, and recently ethyl esters have been prepared by DEL VECHIO. ANDRÉ found the dextrorotatory power of the Brazil oil to be 53·40, that of *Taraktogenos Kurzii* being 48·40, while MACHADO has shown that two of the acids discovered by PECKOLT belong to the chaulmoogra series. Clinical tests by Professor TERRA of Rio de Janeiro, and others have shown the copper preparation of SEABRA is of value in leprosy, while the oil is being used in Brazil with good results and without severe reactions.

L. R.

PONS (R.) & CHASTEL. Essais sur l'action curative du vaccin antituberculeux B C G dans la lèpre. [**Curative Action of the Antituberculous Vaccine B. C. G. in Leprosy.**] *Bull. Soc. Path. Exot.* 1926. July 7. Vol. 19. No. 7. pp. 520–521.

The writers have tried subcutaneous injections of 0·01 to 0·10 gm. of the antituberculous vaccine B.C.G. of the Saigon Pasteur Institute in 5 lepers. They produced temperatures of 39° to 40° C. and congestion of the erythematous patches, followed by disappearance of the patches, diminution of the nodules and general improvement; the

lepra bacilli disappeared from the nasal mucus, but granular bacilli remained in some of the lesions. The vaccine produced abscesses when only diluted to contain 0·01 gm. in 2 cc. of fluid, but greater dilutions avoided them. The inquiry is proceeding, but they desire to call attention to the results so far obtained.

L. R.

DENNEY (O. E.). **The National Leper Home (Marine Hospital No. 66). Review of the More Important Activities during the Fiscal Year ended June 30, 1926.**—*Public Health Rep.* 1926. Nov. 12. Vol. 41. No. 46. pp. 2593–2597. With 8 figs. on 4 plates.

During the year ending June 30, 1926, there were 62 admissions and a total of 259 lepers present, and 3 were paroled with the disease arrested. Intravenous injections of mercurochrome, mercurophen, metaphen, bismuth, neosalvarsan and tryparsamide were tried, and both ultra-violet rays for nerve pains and ulcers and diathermy proved of value. "Treatment with chaulmoogra oil is being continued in a large group of patients, and, while no spectacular results have been obtained with either the oral administration of the crude oil or the intramuscular injection of its ethyl esters, it appears that definite improvement has followed in a sufficiently large percentage of cases to encourage the patients in the continuation of the treatment." The oil is now being given in larger doses in enteric capsules without any nausea in the few cases yet tried.

L. R.

PUPO (J. de Aguiar). Tratamento especifico da lepra pelo oleo de chaulmoogra e seus derivados. (Estudo das flacourtiaceas do Brazil). [**Specific Treatment of Leprosy by Chaulmoogra Oil and its Derivatives. (Study of the Flacourtiaceae of Brazil).**] *Brazil Medico.* 1926. Aug. 7 & 14. Year 40. Vol. 2. Nos. 6 & 7. pp. 69–76; 85–90. [105 refs.]

The first part of this paper constitutes a succinct review of the question, with brief records of the history of the use of the plant, various species of it, the physical properties of the oil—specific gravity, melting point, rotatory power, etc.—and the chemistry of its active principles with graphic formulae of their constitution.

Next, the modes of administration, by mouth and by injection. Statistics as to the results of the former in 82 early cases and 88 in an advanced stage in the leprosarium of Louisiana are presented, 17 per cent. of the former being cured, nearly 50 per cent. more receiving considerable benefit. Of the latter, 20 per cent. showed definite, and another 28 per cent. slight improvement.

No statistics as to the results of the injection treatment are given. Notes culled from previous records are adduced as to the effect of the sodium derivatives of the acids and of the ethyl esters. The initial dose of the latter is 0·5 cc. and the maximum 4·5 cc., treatment continuing for two to four years.

Then follow some remarks upon the mechanism of the therapeutic action of non-saturated fatty acids, the benefits being ascribed to: 1. Direct specific action; 2. Stimulation of the blood lipases; 3. A secondary active immunization from an enhanced antigenic power of the bacilli, which still retain their fatty-waxy covering.

The second part of the paper is purely botanical. There are sketchy notes on the Natural Order Flacourtiaceae, and a list of the members of the allied forms and species in the group.

H. H. S.

RANGEL (Mario). O tratamento da lepra pelas injecções endovenosas de "Antileprol" no Hospital S. Sebastião. [**The Treatment of Leprosy by Intravenous Antileprol.**]—*Rev. Med.-Cirurg. do Brasil.* 1926. July. Vol. 34. No. 7. pp. 295–297.

This paper recounts briefly the effects of antileprol injected intravenously in three patients. In one case daily injections were attempted, but the reaction produced was too great. Bi-weekly injections proved best. The dose varied from 0·5 cc. to 1·5 cc. Within 5 minutes of injection of the smaller dose there was an attack of coughing, lasting for 5–20 minutes; after the larger doses similar coughing with considerable dyspnoea, lasting for 1–2 hours, but readily assuaged by a recumbent posture. In 8–12 hours there was a slight rise of temperature, not exceeding 38°·5 C.

The improvement in 2 patients with mixed leprosy was striking; the nodules diminished in size, the anaesthesia was less marked, the colour of the macules improved and, very noticeable, there was an increased sense of well-being. As the author states, this form of treatment has been employed only during the last six months—too short a time for any definite conclusions to be drawn.

H. H. S.

RANGEL (Mario). A lepra e seu tratamento no hospital São Sebastião. [**The Treatment of Leprosy in the Hospital of São Sebastião.**]—*Rev. Med.-Cirurg. do Brasil.* 1926. Sept. Vol. 34. No. 9. pp. 383–387.

The hospital of São Sebastião was opened for the reception of lepers in 1920, and since then 258 patients have been under treatment, 155 males and 103 females. Four preparations have been employed, namely, chaulmoogrol (the ethyl-esters of the chaulmoogra acids in camphorated oil); chaulmoogra oil prepared in the Oswaldo Cruz Institute (the ethyl-esters of the fatty acids in olive oil); antileprol from Bayer's laboratory (the same but in a very thin oil for intravenous injection); and antilebrina (an Italian preparation containing 75 per cent. of the ethyl-esters of chaulmoogra oil, 20 per cent. cod-liver oil, and 5 per cent. thymol).

The first of these was given to 57 patients and the conclusions reached are that it is efficacious in all forms of the disease, is rapid in action and brings about regression of the local conditions with disappearance of the bacilli from the nasal mucosa. The second caused violent reactions, both local and general, necessitating intermission in treatment, but in those who were able to tolerate it there was definite improvement, though less than with chaulmoogrol. The third was given in doses of 0·4 cc. at the start rising to a maximum of 1·5 cc. Paroxysms of coughing lasting for 5–30 minutes followed immediately and a slight elevation of temperature 6–8 hours later, but there were no serious effects. After 30–40 injections in the course of 3–4 months, there was distinct improvement in the general state, even though the local manifestations remained unchanged. The fourth, antilebrina, yielded results equally as good

as those obtained with chaulmoogrol. About 100 patients have been treated with this, and it is hoped that a continuation of the injections may result in definite cure.

Other preparations such as karpotrau, carpotrochate of copper, colloidal morrhuate of copper, eparseno, thymol, and eucalyptus have also been tried, but in too few cases or for too short a period for any decision to be reached.

Vaccine therapy, by means of various strains of acid-fast bacilli and their autolysed extracts, has been tried in 15 cases with considerable amelioration in two-thirds of them ; nodules diminished in size, ulcers cicatrized, maculae disappeared and the general state improved. In the remainder there was an appreciable effect.

H. H. S.

ISAKA (K). Studies on the Number of Lepers in Okinawa Prefecture.— *Jl. Pub. Health Assoc. Japan.* 1926. Aug. Vol. 2. No. 8. [In Japanese.]

PALDROCK (A.). Die Lepra ist heilbar.—*Dermat. Woch.* 1926. May 1. Vol. 82. No. 18. pp. 597–605. [11 refs.]

RABIES: A REVIEW OF RECENT ARTICLES. VI.*

i. The Virus. Reports continue to be published regarding the properties of the strains of fixed virus in use at various Pasteur Institutes. PALAVANDOFF and WEINBERG[1] write that the Odessa virus (ex Paris) gives symptoms of rabies in rabbits on the 6th or 7th days. Medullas dried at 8 to 10° C. remain fully virulent for one day, and become absolutely avirulent on the 13th day. They have found that a 1-10 emulsion of medulla kills 77 per cent. of mice when injected subcutaneously in a dose of 0·5 cc. per 20 gm. of mouse; that guineapigs and rabbits are refractory to subcutaneous dosage; but that with intramuscular injection the virus of Odessa kills guineapigs and rabbits in 100 per cent. of cases.

ISABOLINSKY and ZEITLINA[2] report on the virus in use at Smolensk. At this institute the virus used for case treatment is kept in 80 per cent. glycerine. It maintains its virulence in this vehicle for not longer than 15 days, and in olive oil for not more than a week.

PLANTUREUX[3] gives a further description of the properties of the Algerian strain (see also this *Bulletin*, Vol. 23, p. 693), which is now in its 1,550th passage. This virus was compared experimentally with a young strain in its 90th passage, and it was found that, if anything, the immunizing properties of the old virus were better than those of the young.

MARIE[4] has examined the original Paris strain which has been in use over a period of thirty years. He has found that a 6-day dried cord is just as virulent, when injected intracerebally into guineapigs, as it was thirty years ago. He adds that the length of the incubation period is not altered by desiccation.

It would thus appear that, in institutes where a well controlled system of subpassaging is employed, there is little risk of deterioration with continued subpassage. It should be remembered, however, that in institutes where the system of treatment employed does not necessitate the use of so many rabbits as does the dried cord method, it may not be so easy to control the system of subpassaging.

TAKAYA[5] has investigated the effects of ultra violet rays on both fixed and street virus. Radiation was employed in some instances for 30 minutes, and in others for 60 minutes, and at distances of 30 and 60 cm.

* For the fifth of this series see Vol. 23, pp. 689-699.

[1] PALAVANDOFF (G. B.) & WEINBERG (B. G.). [Des propriétés biologiques du virus rabique fixe d'Odessa.]—*La Médecine Prophylactique.* 1926. July-Aug. Nos. 7 & 8. p. 40. [Summarized in *Bull. Inst. Pasteur.* 1926. Oct. 31. Vol. 24. No. 20. p. 912.]

[2] ISABOLINSKY (M.) & ZEITLINA (A.). Zur Frage ueber die biologischen Eigenschaften des Virus fixe.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. Nov. 8. Vol. 49. No. 1–2. pp. 67–73.

[3] PLANTUREUX (Edm.). Le virus rabique fixe d'Alger, au 1.550e passage, n'a rien perdu de son pouvoir immunisant contre le virus des rues.—*C. R. Soc. Biol.* 1926. June 25. Vol. 95. No. 22. pp. 192–194. [2 refs.]

[4] MARIE (A. C.). Virulence des moelles utilisées pour les vaccinations antirabiques.—*C. R. Soc. Biol.* 1926. Nov. 19. Vol. 95. No. 33. pp. 1194–1195. [1 ref.]

[5] TAKAYA (K.). Experimental Studies on Rabies (Hydrophobia). The Influence of Ultraviolet-Rays on the Virus of Rabies.—*Oriental Jl. Dis. Infants.* 1926. Oct. Vol. 1. No. 4. English summary pp. 103–104. [In Japanese.]

The virus so treated was then injected into the subarachnoid space "by Dr. Yamaoka's method." Both street and fixed viruses were weakened by the exposure, and when the intensity of the rays was strengthened the virus was killed altogether. Fixed virus was more resistant than street.

ii. Symptoms and Course.—CECCHERELLI[6] after collating cases of long incubation period from the literature, describes a case in which the incubation period lasted for 8 months and 20 days. A large rabid wolf hound bit 5 or 6 dogs, numerous ducks, a sheep and a goat. The ducks died within 3 to 10 days, the dogs within a month; the sheep developed symptoms after a month and was shot; the goat died of rabies after the specified interval. It had not been bitten by any other animal during the interval. Its brain was proved to contain the virus by animal experiment. Negri bodies were present in the hippocampus.

JONNESCO[7] describes two cases of pseudo-rabies in man.

PERGHER[8] discusses the questions of congenital transmission of rabies, and recurrent rabies. The article is a summary of results collected from the literature. He lays stress on the view that in recurrent rabies the animal may be infective for many weeks or months prior to its death, and advises that the history and circumstances of the case must be taken into account before a diagnosis of rabies is excluded.

BABES and BOBES[9] contribute a long article on premonitory and periodic fever in rabies. After laying stress on the occurrence of a low degree of fever in the premonitory stages they pass on to the infectivity of the animal at this period. Three cases are described in which the animal was proved to be infective. The first—that of a cat—was one of remittent rabies. During the interval of 10 days between the attacks the animal was apparently healthy and was returned to its owner. It died in its second attack, and its brain was infective to a rabbit. The second—a dog—also a case of remittent rabies, after an attack in which it bit a number of persons and dogs, experienced an intermission 25 days, and was killed during the second attack. One person, bitten during the first attack, whose treatment had been discontinued, developed rabies on the 25th day after the bite. The third—another cat—showed a 12 days intermission. A number of persons were bitten during each attack. The treatment of the first group, which had been discontinued during the intermission, was recommenced. The authors conclude that treatment should be given in such cases even though the biting animal may apparently recover.

iii. Pathology and Serology.—A group of three papers in *Virchow's Archives* deals with pathological changes found in the nervous system in cases of rabies. In the first SLOTWER[10] finds evidences of changes probably of toxic origin in the midbrain. These are probably specific

[6] CECCHERELLI (Riccardo). Incubazione lenta della rabbia.—*Clin. Vet.* 1926. Nov. Vol. 49. No. 11. pp. 719–722.

[7] JONNESCO (Démètre). Pseudo-rage chez l'homme: diagnostic et traitement. —*Presse Méd.* 1926. Nov. 6. Vol. 34. No. 89. pp. 1397–1398. [11 refs.]

[8] PERGHER (Giuseppe). Modi eccezionali trasmissione della rabbia.—*Ann. d'Igiene.* 1926. June. Vol. 36. No. 6. pp. 447–461. [64 refs.]

[9] BABES (V.) & BOBES (S.). Bemerkungen ueber das prämonitorische und das periodische Fieber bei Lyssa sowie ueber die Bedeutung der prämonitorischen Anfälle für die menschliche Wut.—*Cent. f. Bakt.* I. Abt. Orig. 1926. July 6. Vol. 99. No. 1–3. pp. 110–115. [9 refs.]

[10] SLOTWER (B. S.). Pathologisch-anatomische Veränderungen im Zwischenhirne bei der Lyssa.—*Virchows Arch. f. path. Anat.* 1926. Sept. 30. Vol. 261. No. 3. pp. 787–794. With 5 text figs. [11 refs.]

though this is not yet certain. These changes are of two types, viz.: collections of neuroglial cells, and accumulations of lymphocytes chiefly round the vessels. They vary in degree in the same nucleus in different cases, and in different nuclei in the same case. In six cases the substantia nigra was affected, in 5 the "supraoptic" nucleus, in 6 the paraventricular nucleus, in 3 the grisea centralis and in 3 the corpus luysii. In the second CHACHINA[11] describes similar inflammatory changes in the sympathetic ganglia. Those of the neck and trunk are most affected, and of the solar plexus to a lesser degree. The degree of the changes observed is not related to the duration of the illness, nor to the length of the incubation period. These changes cannot be considered as diagnostic of rabies. KRINITZKY[12] in a third paper finds similar changes in the subcortical ganglia, in Ammon's horn, and in the small brain. In all parts neuronophagia is apparent, especially in the horn of Ammon. He considers infiltration of vessel walls with round cells, accumulations of cells especially in the neighbourhood of the ependyma, and a sharply defined degenerative change of the nerve cells, to be specific of rabies.

STICCO[13] has examined the urine of 123 rabbits which had died of fixed virus rabies. In 121 of these albumen was present (99·18 per cent.). In 51 sugar was found. Sugar was also present in a case of street virus rabies, whilst the reaction was negative in nine normal animals.

DA SILVA[14] has obtained negative results from experiments devised to show the presence of rabicidal substances in nerve cells. A rabbit which had received a 15 days' treatment with etherized fixed virus was killed by bleeding, one month after its last injection. Its brain was emulsified in saline, filtered, and mixed with varying proportions of a 1-100 emulsion of fixed virus brain. The mixture was tested for virulence on 12 rabbits with negative results. The serum of the same rabbit, however, was rabicidal. In a further communication[15] DA SILVA describes two cases. In the first rabicidal substances were demonstrable in the blood, 15 days after completion of treatment. In the second no substances were found 31 days after the bite. The latter case died of rabies shortly afterwards.

By means of cooked antigens and glycerine extracts of rabies brain, KRAUS and MICHALKA[16] have obtained as specific complement fixation as has been obtained in the case of other filtrable viruses. Following the technique of TAKAKI, BORIS and KOREF, KRAUS and TAKAKI (*Med. Klinik.* 1925, *Wien. Klin. Woch.* 1926), they used a cooked anti-

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[11] CHACHINA (S.). Veränderungen der sympathischen Ganglien bei Tollwut.—*Virchows Arch. f. path. Anat.* 1926. Sept. 30. Vol. 261. No. 3. pp. 795–801. With 5 text figs.

[12] KRINITZKY (Sch. I.). Veränderungen im zentralen Nervensystem bei Tollwut.—*Virchows Arch. f. path. Anat.* 1926. Sept. 30. Vol. 261. No. 3. pp. 802–820. With 14 text figs.

[13] STICCO (Emilio). Ricerche urologiche nella rabbia sperimentale del coniglio.—*Clinica Vet.* 1926. June. Vol. 49. No. 6. pp. 345–359. [24 refs.]

[14] da SILVA (E. Pereira). Sang et cellule nerveuse dans l'immunisation antirabique.—*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. pp. 1287–1288.

[15] da SILVA (E. Pereira). Substances rabicides du sang et immunisation antirabique.—*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. pp. 1289–1290.

[16] KRAUS (R.) & MICHALKA (J.). Die Diagnose des Lyssavirus mittels Komplementablenkung mit Koktoimmunogen und Glyzerinextrakt. II. Mitteilung.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. June 28. Vol. 47. No. 6. pp. 504–519. [8 refs.]

gen prepared as follows. Pieces of brain are placed in 50 per cent. glycerine, and an emulsion is made with ten times the quantity of normal saline. The emulsion is cooked in a water bath for half an hour, and placed in the ice chest for 12 to 14 hours. The suspension is then strongly centrifuged and the opalescent supernatant fluid decanted. The antigen must be freshly prepared. Three doses of antigen are used (0·05, 0·02, and 0·01 cc.) against three doses of inactivated serum (0·1, 0·05, and 0·025 cc.). Each test is made up to 0·25 cc. with normal saline. One quarter of a cc. of 1-10 complement is added, and the mixture kept at 37° C. for one hour. Thereafter, 0·5 cc. sheep cells (5 per cent.), sensitized with 2 doses of immune body, are added. The first reading is made when the controls are haemolysed. The critical reading is made after 24 hours. In readings taken after 12 hours the effects of the normal constituents of the brain substance are apparent, but after 24 hours these perturbations disappear. Successful results were also obtained in further experiments in which glycerine extracts were used as antigen. Attempts were made by these means to differentiate rabies from distemper. Cooked antigens gave satisfactory results, but the authors believe that better results were obtained using the glycerinated antigen.

Biglieri and Villegas[17] have found that immunity against rabies is not necessarily a blood immunity. Sometimes a solid immunity is observed with no antibodies in the blood, and *vice versa*. The spleen, kidney and suprarenals of immunized animals are definitely rabicidal. They find that intradermal inoculation treatment is more effective than subcutaneous. They do not recommend this as a method for human treatment, if the vaccinal material is living. Following the ideas of Besredka they have treated animals by injecting directly into the nervous tissue. The effect was a prolongation of the incubation period.

Gorovits-Vlasova[18] finds that antigens treated with phenol are more serviceable for the complement deviation reaction than those treated with glycerine. Using antigens prepared from brain or salivary glands of rabbits dead of rabies, they were able to detect antibodies in the blood of rabbits injected with fixed virus. When the injection was given subdurally antibodies appeared on the 5th day, and when given intravenously on the 7th to 10th day.

In the case of a woman dead of rabies German[19] has been able to demonstrate the infectivity of the blood serum. The virulence was very low. A rabbit inoculated subdurally with the blood serum developed rabies in 8 months.

iv. Epidemiology and Control.—In a very interesting and full paper Blankenburg[20] discusses the epidemiology of rabies in Germany from remote times. Full statistics are tabulated, giving the data from 1886 to date. By the aid of tables and of charts, variations

[17] Biglieri (R.). & Villegas (C.). Immunité locale dans la rage.—*C. R. Soc. Biol.* 1926. Nov. 12. Vol. 95. No. 32. pp. 1176–1177.

[18] Gorovits-Vlasova (L. M.) [Deviation of Complement in Rabies.]—*Profilakticheskaya Med.* Kharkov. 1926. Apr. Vol. 5. p. 18. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Oct. 30. Vol. 87. No. 18. p. 1524.]

[19] German (O. A.). [Virulence of Blood in Rabies.]—*Profilakticheskaya Med.* Kharkov. 1926. Apr. Vol. 5. p. 14. [Summarized in *Jl. Amer. Med. Assoc.* 1926. Oct. 30. Vol. 87. No. 18, p. 1524.]

[20] Blankenburg (Willi). Zur Epidemiologie und Bekämpfung der Tollwut.—*Arch. f. Wissenschaft. u. Prakt. Tierheilk.* 1926. Nov. 3. Vol. 55. No. 1. pp. 1–50. With 6 charts. [35 refs.]

from year to year are demonstrated and discussed. Other tables show the comparative prevalence in the different States and provinces, and these are contrasted and compared with the prevalence of the disease in countries which border upon Germany. He then discusses the various measures which have from time to time been adopted. It appears, according to the author, that only in England, Holland, and Germany has the great increase which followed the war been effectively combated.

GIESE[21] also discusses the epizootic of rabies which commenced in Germany in the early months of 1922. This reached its maximum in the summer of 1924, and then was rapidly brought under control. The author ascribes the outbreak to the breakdown of the civil authority in the countries which lay beyond the new boundaries on the eastward side of Germany.

VON OSTERTAG[22] describes the general measures which were adopted to check the inroads of the epizootic into the State of Würtemberg, and pleads for closer co-operation between the veterinary surgeon and the physician.

BARBIER[23] describes an epizootic of rabies amongst foxes in the arrondissement of Dijon. Since 1921 rabies had been continuously present amongst stray dogs. In 1925 it was realized that the source of infection might lie amongst the foxes which are prevalent in this region. In the first half of 1926 eleven carcasses of foxes were examined, and proved to be rabid. Baits containing sulphate of strychnine were thereafter laid down and by June 15th the carcasses of 119 foxes, 11 badgers, 2 wild cats and a number of stray dogs were collected. This campaign has led to satisfactory results.

v. Canine Rabies and its Control.—In the previous paragraph we have dealt with the general aspects of the control of epizootics; we may now pass to a larger group of communications, which deal with dog inoculation and the various methods by which dogs may be protected against the disease. LUBINSKI[24] gives a general summary of the subject and discusses the many methods which have been adopted. GIESE[21], in the paper already mentioned, after a similar résumé describes experiments devised to test the efficacies of the methods of Umeno and Doi, and of Pokschischewsky.

The former method was employed in the case of 45 dogs. Of these 33 were protected, 6 were unprotected, and of the remainder 2 died from intercurrent disease, 3 of dumb rabies and 1 of furious, before the test dose was administered. Of 21 controls, 19 died from the test dose of street virus, and 2 escaped. In a second series GIESE used Pokschischewsky's method, modified as follows. Half of the brain of a fixed virus rabbit was emulsified in 7·5 cc. of "rindfleish wasser," and a dose of 6 cc. of this emulsion, i.e., about two-fifths of a brain, was injected intraperitoneally.

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[21] GIESE (Cl.). Schutzimpfungsversuche gegen die Tollwut bei Hunden.—*Arb. a. d. Reichsgndhtsamt.* 1926. Vol. 57. pp. 410–444. With 1 chart in text. [Refs. in footnotes.]

[22] VON OSTERTAG. Die rasche Wirkung der in den neuen Normativbestimmungen festgelegten Nassnahmen zur Bekämpfung der Tollwut der Hunde. Ein Beispiel aus der letzten Tollwutverseuchung Württembergs.—*Reichs-Gesundheitsblatt.* Berlin. 1926. Mar. 3. Vol. 1. No. 9. pp. 224–227. [1 ref.]

[23] BARBIER (A.). Une epizootie de rage sur le renard.—*Rev. Gén. de Méd. Vét.* 1926. Nov. 15. Vol. 35. No. 419. pp. 609—618. [4 refs.]

[24] LUBINSKI (Herbert). Die Bekämpfung der Lyssa.—*Klin. Woch.* 1926. Nov. 19. Vol. 5. No. 47. pp. 2221–2224.

Of 9 treated dogs, 5 were protected, 3 were unprotected, and 1 died of intercurrent disease. Of 3 controls, all succumbed to the disease.

KARMANN[25] recapitulates the above experiments of GIESE, and also those of MIESSNER and BAARS, to which I referred in my former summary (this *Bulletin*, Vol. 23, p. 698). He concludes, as does LUBINSKI[24], that no sure and simple method of dog protection is as yet available.

GONSALVES[26], after the customary review, states that half a million dogs have been immunized by Umeno and Doi's method at the Institute Oswaldo Cruz, and presses for the adoption of his lipo-vaccine (to 1 to 2 gm. of titrated brain substance is added 0·5 to 1 gm. of pure lanoline—thereafter, 2·5 to 5 cc. of olive oil is thoroughly intermixed) (see also this *Bulletin*, Vol. 23, p. 696).

PLANTUREUX[27, 28] describes experiments in which vaccines containing 1/2,000 of formol were employed. This vaccine was borne without ill effect in doses varying from 10 to 80 cc. in the case of 10 rabbits and from 70 to 100 cc. in the case of 12 dogs, 10 sheep, and 4 goats. Of these 6 dogs, 6 sheep, 2 goats, and 6 rabbits resisted an intraocular injection of street virus, whilst the controls developed rabies. The doses were given in 3 to 6 injections, and it was found that the immunity was more marked with the larger number of inoculations and when the doses were spaced at relatively wide intervals. In a second experiment the vaccine was administered after the test dose had been given. Of 18 dogs which received 5 cc. of a 1-25 dilution of street virus into the muscles of the flank, 7 were kept as controls and ultimately succumbed to the disease. Of the remaining 11, which received vaccine in doses increasing from 10 to 30 cc., on four occasions at 2, 3, and 4-day intervals, only 1 developed rabies.

PUNTONI[29, 30] gives further results of his method of auto-vaccination (this *Bulletin*, Vol. 22, p. 251). He has used it with invariable success for 32 bitten animals. Of these 54 per cent. were bitten on the head, and in the case of 26 per cent. treatment was commenced in the second week. In place of 1 per cent. phenol, he now uses 1/2,000. The doses are 20 cc. for oxen and horses and 5 cc. for dogs, daily for 15 days.

FINZI[31] claims to have achieved complete success from the use of a mixed vaccine, "which is able to develop a specific homologous or heterologous immunity—fixed virus of the dog or of the rabbit—and a non-specific homologous immunity—normal nerve substance of the dog." The results of his experiments are not summarized, but are contained in a detailed table, which includes even the name and the

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25 KARMANN (P.). Zur Frage der Immunisierung der Hunde gegen Tollwut.—*Reichs-Gesundheitsblatt*. Berlin. 1926. Oct. 20. Vol. 1. No. 42. pp. 897–899.

26 GONSALVES (N. Botafogo). La vaccination antirabique des chiens au moyen d'une seule inoculation.—*C.R. Soc. Biol.* 1926. Oct. 22. Vol. 95. No. 29. pp. 996–997.

27 PLANTUREUX (Edm.). Vaccin antirabique formolé.—*C.R. Acad. Sci.* 1926. June 21. Vol. 182. No. 25. pp. 1578–80.

28 PLANTUREUX (Edm.). Traitement antirabique des animaux par un vaccin formolé.—*Rev. Gén. de Méd. Vét.* 1926. Nov. 15. Vol. 35. No. 419. pp. 619–624. [1 ref.]

29 PUNTONI (V.). Applicazioni pratiche dell'autovaccinazione antirabica.—*Ann. d'Igiene.* 1926. Aug. Vol. 36. No. 8. pp. 569–574. [5 refs.]

30 PUNTONI (Vittorio). Applicazioni pratiche dell'autovaccinazione antirabica.—*Clinica Vet.* 1926. July. Vol. 49. No. 7. pp. 411–416. [6 refs.]

31 FINZI (Guido). Studi e osservazioni sulla vaccinazione antirabica curativa dei cani.—*Clin. Vet.* 1926. Oct. Vol. 49. No. 10. pp. 609–633. [28 refs.]

address of the dog's owner. An analysis of this table shows that with a treatment of 3 doses given on successive days to 71 dogs, 52 remained well, 1 developed rabies, and in the case of the remaining 18 the result was for various reasons inconclusive. These statistics refer to cases in which treatment was commenced within 12 to 15 days after the bite.

vi. Methods of Immunization.—VOLPINO and FINOCCHIO[32] describe a method of treatment which has proved successful in 500 cases. This consists in the use of a carbolized-ether-virus. They employ ether, not so much on account of its attenuating action on the virus, but rather on account of its effect in removing toxic substances from the vaccinal material. Triturated brain substance is immersed in ether for a period of 24 to 48 hours, in the proportion of one brain and cord to 50 cc. of ether. After six hours the ether is decanted, and the sediment is again triturated with the object of freeing it from any trace of extractives. To this deposit is slowly added a half per cent. solution of phenol in the proportion of 100 cc. to each 5 gm. of nerve substance. The resulting suspension is more transparent than a fresh carbolized emulsion, and is less toxic to rabbits. In fact, whilst ½ cc. of a 5 per cent. suspension of nerve substance (phenolized 1 per cent.) kills a rabbit instantaneously when administered intravenously, it was necessary to employ 2 cc. of the carbolized ether vaccine to obtain a like effect.

PUNTONI[33] discusses the relative efficacies of the various carbolized vaccines. He claims, as a result of animal experiments, that his own mode of preparation is superior to that of SEMPLE though the latter has the advantage of greater simplicity in preparation and in transportation. He proposes to carry out a comparative test, in which his own method will be employed in the case of patients treated at the Institute in Rome, whilst SEMPLE'S vaccine will be sent out to the provinces and employed in the case of persons bitten at a distance. He criticizes FERMI'S carbolized serum vaccine adversely.

According to DA SILVA,[34] 1,158 persons have been treated at the Lisbon institute during the year 1925 with ether virus. Only one of these developed rabies—a woman who had been bitten on the leg and foot by a cat. The method employed is rather simpler than that of ALIVISATOS and HEMPT. A daily injection of 5 cc. in the case of adults and 3 or 2 cc. in the case of infants is administered. At first 15 daily injections were given to those severely bitten, 10 in less severe, and 5 in slight cases. After the occurrence of the above mentioned fatal case, these numbers were increased to 30 and 20. Rabicidal substances have been demonstrated in the blood of 30 persons. After 9 injections it was found that a dose of 1/100 fixed virus was neutralized by an equal or double volume of the serum, after 19 injections by a double or triple volume of the serum, and that the rabicidal potency of the serum was at its maximum a few weeks after completion of treatment. In certain exceptional cases no such properties could

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[32] VOLPINO (Guido) & FINOCCHIO (Marco). Studio sul vaccino antirabbico fenicato e proposta di un vaccino etero-fenicato.—*Riforma Med.* 1926. Aug. 9. Vol. 42. No. 32. pp. 748–750.

[33] PUNTONI (Vittorio). Die karbolisierten Impfstoffe gegen die Tollwut.—*Seuchenbekämpfung.* 1926. Vol. 3. No. 5-6. pp. 260–263. [2 refs.]

[34] DA SILVA (E. Pereira). Apparition précoce de substances rabicides dans le sang des individus traités par le virus rabique fixe éthérisé.—*C.R. Soc. Biol.* 1926. July 2. Vol. 95. No. 23. pp. 323–325. [5 refs.]

be demonstrated. In a further paper DA SILVA[35] states that with 5 injections rabicidal activity disappears in a period of 42 days, whilst with 10 or 20 injections it may persist for 150 days.

CUNNINGHAM, NICHOLAS AND LAHIRI[36] have carried out a careful experimental investigation of the effects of ether on the strain of fixed virus employed at Kasauli (India). They find that this strain is less resistant to the effects of ether than the strains employed by REMLINGER and ALIVISATOS. Immersion of the Kasauli strain for 84 hours apparently corresponds to immersion of the other strains for 120 hours. In the case of cords, virulence was lost after 12 hours immersion. They also found that exposure to ether vapour acted as quickly as actual immersion in the fluid. (Exposure to ether, whilst no doubt attenuating the virus in a satisfactory manner, would not of course remove the extractives.) In all 117 rabbits were employed. At the conclusion of these experiments all survivors were inoculated with fixed virus. Only one failed to develop the disease. Thus it appeared on the one hand that none of the test animals was naturally immune, and also that no immunity had developed as a result of the single dose of etherized virus which they had received.

Two authors have turned their attention to the cutaneous administration of vaccines. HALIAPINA[37] found that the application of fixed virus emulsion to the scarified surface of the abdomen of guinea-pigs invariably led to the development of rabies. The author attributes this effect to the exposure of the nerve fibrils of the *stratum germinativum*. GEORGES[38] similarly found that in the case of rabbits inoculation by friction succeeded in 50 to 98 per cent. of cases. The surviving animals were then tested for immunity by subdural inoculation of fixed virus. Of 15 of these, 10 proved to be resistant to the test dose. The author is employing cutivaccination along with the ordinary treatment in the case of persons who have been severely bitten. He has so far treated 19 persons bitten on the hand or face, and 5 bitten on the hand, by this method. One has died of rabies, the others have survived for periods of from three to seven months.

vii. Statistics of Treatment.—KRANZFELD[39] describes in general terms the activities of the various institutes in the Russian States. Vaccines are sent out from the Institutes at Leningrad, Moscow, Minsk, Rostov on the Don, and Odessa. Carbolized vaccines are prepared at Leningrad and Odessa, dried cords in glycerine at Rostov and Moscow, and glycerinated emulsions of fresh brain at Minsk. In the year 1925, 2,287 persons received such treatment. No numerical results are as yet available.

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[35] DA SILVA (E. Pereira). Persistance de substances rabicides dans le sang des individus traités par le virus rabique fixe éthérisé.—*C. R. Soc. Biol.* 1926. July 2. Vol. 95. No. 23. pp. 326–327.

[36] CUNNINGHAM (J.), NICHOLAS (M. J.) & LAHIRI (B. N.). An Investigation into the Value of an Etherised Vaccine in the Prophylactic Treatment of Rabies. Part I. The Action of Ether on Fixed Virus.—*Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 505–520. [4 refs.]

[37] HALIAPINA (K.). Rôle de la peau dans l'infection de la rage.—*Trav. Inst. Microbiol. et Hyg. d'Azerbaidjan.* Baku. 1925–26. Nos. 2–3. pp. 282–286. [In Russian.]

[38] DE GEORGES (L. V.). Essai d'immunisation locale contre la rage par la voie cutanée.—*C. R. Soc. Biol.* 1926. Nov. 5. Vol. 95. No. 31. pp. 1096–1097.

[39] KRANZFELD (A.). Die Versendung des Wutschutzimpfstoffes in der U.S.S.R. —*Seuchenbekämpfung.* 1926. Vol. 3. No. 5-6. pp. 263–264.

The number of persons treated at Tunis[40] during the year 1925 was 934; amongst these occurred 9 deaths, of which 3 were failures. Treatment is by the dried cord method, using cords which have been desiccated from 2 to 4 days.

JOANNOVITCH[41] summarizes the statistics emanating from the institutes of Serbia and other Balkan States during the period 1920 to date. At Niche, where Högyes method is ordinarily employed, with ether virus in severe cases, 9,128 persons were treated during this period with 37 deaths and a single failure (0·012 per cent.). At Novi Sad from 1922 to the end of 1925, 8,325 persons were treated with 15 deaths and no failure. At Sarajevo amongst 1,900 persons treated there occurred 10 deaths and no failure. At these latter institutes only ether virus is now employed.

From Coonoor[42] (India) CORNWALL reports that amongst 572 persons treated at the institute there occurred 7 deaths, 4 of which were failures. From this institute vaccine is also dispatched to local centres. At these 4,072 persons were treated during 1925, with 28 deaths, of which 16 were failures. From Shillong[43] we have received record of 1,176 persons treated with 11 deaths, of which 4 were failures. And from the institute at Calcutta[44], which has issued its first report, we have record of 17 deaths including 7 failures, amongst 1,461 persons treated. The statistical records of the Indian Institutes are very complete, and are worthy of imitation.

viii. Paralytic Accidents.—This problem, to which I have frequently referred, engages the attention of many writers. In almost every instance the whole literature bearing on the subject is surveyed, and thereafter the author draws his own conclusions. Very complete résumés will be found in the papers by BUSSON[45], by MARIO TINTI[46], and by LUBINSKI[47]. The former holds that under given conditions fixed virus may become neurotropic, and so lead to paralyses. He lays stress upon the presence of fixed virus in the nervous system of persons who have died as a result of paralytic accident, and upon the constancy of the incubation period (16 days after the completion of treatment). The second argues strongly in favour of the anaphylactic origin of the neurosis. The third, in a very excellent and judicial summary, which is well worthy of study, whilst setting aside as

[40] ARCHIVES DE L'INSTITUT PASTEUR DE TUNIS. 1926. June. Vol. 15. No. 2. pp. 176–190. Fonctionnement des services de l'Institut Pasteur de Tunis pendant l'année 1925. [C. N.]

[41] JOANNOVITCH (G.). Les résultats du traitement antirabique dans le royaume des Serbes, Croates et Slovènes, pendant les années 1920 à 1924.—*Bull. Office Internat. d' Hyg. Publique.* 1926. July. Vol. 18. No. 7. pp. 789–791.

[42] COONOOR, SOUTHERN INDIA. The Pasteur Institute. The Ann. Rep. of the Director for the Year ending 28th February, 1926. [CORNWALL, J. W.]—28 pp. 1926. Madras: Govt. Press. [For Official Use only.]

[43] ASSAM. King Edward VII Memorial Pasteur Institute and Medical Research Institute, Shillong. Ninth Ann. Rep. for Year ending 31st Dec., 1925. [HODGSON, E. C., Director.]—25 pp. 1926. Shillong: Govt. Press.

[44] CALCUTTA. School of Tropical Medicine and Hygiene. First Annual Report of the Pasteur Institute, Calcutta, for the Year 1924. [FOX (E. C. R.), Supt.]—pp. 3+17. 1926. Calcutta: Bengal Secretariat Book Depot.

[45] BUSSON (B.). Zur Frage der Aetiologie der postvaccinalen Lähmungen nach Wutschutzimpfungen.—*Cent. f. Bakt.* I. Abt. Orig. 1926. July 6. Vol. 99. No. 1-3. pp. 80–109. [4 refs.]

[46] TINTI (Mario). Paralisi acute da vaccinazione antirabica.—*Riv. di Clin. Med.* 1926. May 15. Vol. 27. No. 9. pp. 325–47. [33 refs.]

[47] LUBINSKI (Herbert). Zur Ätiologie der nach Schutzimpfung gegen Lyssa vorkommenden Lähmungen.—*Klin. Woch.* 1926. July 30. Vol. 5. No. 31. pp. 1419–1421.

untenable the influence of street virus, considers that experiments for and against the instrumentality of the toxins of fixed virus and of the toxic substances of normal brain material are still inconclusive. He draws attention to PAPAMARKU's observations on the relative insusceptibility to accident of the civil as compared with the military communities in Germany and Austria during the period of the Great War. The occurrence of accidents was four times as great amongst the latter as compared with the former. Similarly, in Vienna prior to 1915, no accidents occurred amongst 6,814 cases, whilst from 1915 to 1923 there occurred 35 amongst 7,875 persons treated. Also in Java, amongst the native population only 2 accidents were reported whilst amongst Europeans there were 19, although the number of natives treated was twice as great as the number of Europeans. He also lays stress on the fact that the presence of fixed virus in the brain of a person who has succumbed from paralytic accident does not prove that the fixed virus was the cause of the condition ; and quotes a case from his own experience in which the same finding was obtained in the case of a person who died during treatment from tubercular meningitis. HERRMANN[48] covers similar ground, and ISABOLINSKY and ZEITLINA[2] state that in Smolensk, where 6,000 persons were treated with glycerinated fixed virus, no accidents occurred. PLANTUREUX[49] observed cases of cachexia in dogs which had been treated with homologous formolized virus. It is clear that until the experiments of SCHWEINBERG upon the toxicity of normal brain substance are confirmed, no conclusion can be arrived at. It is satisfactory to note that this is one of the questions which will be discussed at the forthcoming International Rabies Conference in Paris.

ix. Miscellanea.—LOGUE and MORRISON[50] report the finding of Negri bodies in the brain of a rabbit inoculated with street virus. BOLAFFI[51] describes the technique of OSHIDA's method of cord extraction.

BUSSON,[52] influenced by recent discoveries as to the relations which exist between filterable viruses, and to the modifications which occur in these during the course of subpassage, has examined the effect of immunization by variola vaccine upon susceptibility to rabies. His first observation was that a rabbit so treated proved to be resistant to an intracerebral dose of fixed virus. A second experiment was carried out with eight guineapigs, which were tested with street virus. All the guineapigs proved resistant, although the street virus killed 4 out of 7 rabbits which were used as controls. From these and other experiments Busson concludes that variola vaccine has the power of conferring an immunity against rabies. Whether this immunity is specific or not he is not prepared to say.

A. G. McKendrick.

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[48] HERRMANN (Otto). Die Ursachen der antirabischen Paralysen (experimentelle und klinische Beobachtungen). Mitteil. I.-III.—*Cent. f. Bakt.* I. Abt. Orig. 1926. Oct. 30; Nov. 26. Vols. 100. Nos. 4-6; 7-8. pp. 178–195 ; 320–334 ; 334–347. [Numerous refs.]

[49] PLANTUREUX (Edm.). Accidents paralytiques observés sur des animaux à la suite du traitement antirabique.—*C. R. Soc. Biol.* 1926. July 9. Vol. 95. No. 24. pp. 361–363.

[50] LOGUE (J. B.) & MORRISON, Jr. (O. B.). Rabies. With Animal Experimentation.—*U.S. Nav. Med. Bull.* 1926. Vol. 24. No. 3. pp. 574–7.

[51] BOLAFFI (Aldo). Il metodo di Oshida per la estrazione dei midolli destinati alla preparazione del vaccino antirabico (Nota di Tecnica).—*Pathologica.* 1926. Sept. 15. Vol. 18. No. 419. pp. 429–430. [2 refs.]

[52] BUSSON (Bruno). Blatternschutz- und Tollwutinfektion.—*Wien. Klin. Woch.* 1926. Oct. 7. Vol. 39. No. 41. pp. 1183–1185.

MISCELLANEOUS.

BORCHARDT (W.). Zur normalen und pathologischen Physiologie des Schwitzens. **Normal and Pathological Sweating.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Oct. 1. Vol. 30. No. 10. pp. 629–638. [9 refs.]

The author investigated a large number of persons living in a moist tropical climate at a temperature of 33° C. (91° F.) and found a certain percentage who had an imperfect heat-regulation; their body-temperature rising 0·3° C. (more than half a degree F.), with corresponding acceleration of the heart. The cause seems to be a scanty sweat secretion. It would therefore be wise to follow STEUDEL's advice for people who propose to live in the tropics to have their reaction to high temperatures tested experimentally at home before deciding to reside in a hot region. The effect of heat on the tissues is regarded as direct and leading to impairment of the nervous system. The author attaches some importance to the loss of salts (especially of sodium chloride) by the sweat, and the muscular fatigue after sweating he attributes to this cause. Examination of the serum reveals there is a loss of potassium salts also. He speaks of depots in the body of Na, K, Ca and Cl, but that is a more theoretical aspect of the subject.

W. D. Halliburton.

BRAHMACHARI (Upendra Nath) & SEN (Parimal Bikash). **Researches on Blood-Sugar in Indians. Part II. Normal Renal Threshold for Sugar in Young Indians.** *Indian Jl. Med. Res.* 1926. Apr. Vol. 13. No. 4. pp. 751–754.

The authors showed in a previous communication that in healthy young Indians (Bengalee medical students) about 10 per cent. (5 out of 47) were potential diabetics. This result was obtained by the sugar tolerance test of their blood. About the same proportion (5 out of 43) became glycosuric after a dose of 50 gm. of glucose. They continue the research in the present investigation on the normal renal threshold in 16 similar students. The glucose was given before breakfast in doses of 50 gm. or in some cases of 150 gm. or more. The result found is that the normal renal threshold is about 0·175 per cent., which is practically the same as in Europeans. In rare cases (2 out of the 16) the threshold is somewhat high, but that is also the case with healthy Europeans.

W. D. H.

CLARK (H. C.). **Some Studies of Treatment by Intravenous Injections of Mercurochrome and Neosalvarsan.**—*Fourteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1925. pp. 208–212.

The Medical Staff of Almirante Hospital, Panama, presented an analytical report on 25 cases treated intravenously with mercurochrome and 26 cases with neosalvarsan, and the report is abstracted by Dr. Clark. There were 25 cases of malaria, 12 treated with one drug and 13 with the other, 14 cases of syphilis treated with neosalvarsan,

9 purulent infections and 3 pneumonias treated with mercurochrome. Notes are given on the urine, haemoglobin, erythrocytes and leucocyte counts for each disease. A summary of the conclusions is as follows: No variation of importance in the urinary findings. No change of significance in the blood. A differential leucocyte count made of 105 people in a camp of labourers in Honduras shows the wide variation in individuals considered normal. Dr. Clark suggests a similar experiment on a series of healthy cases, e.g., after accidents.

A. G. B.

McCord (J. B.). **Native Witch Doctors and Healers.** *S. African Med. Rec.* 1926. May 8. Vol. 24. No. 9. pp. 195–205.

After giving an account of the witch doctors and healers among the Zulus and their misdeeds, the author writes:

"What the people of Africa need is a well educated, competent medical man of their own race in each community. A native who is willing to live in a native community, and who has received a good medical education. A native who is accustomed to the native method of living and who would live among his own people on much the scale as the people themselves live. A man in their own community to visit the sick in their homes, and give them the medical attention which they should have."

A recent Commission has recommended that provision be made in South Africa for medical education for the natives, and already such a course is being given at one Native College.

A. G. B.

Trocello (E.) & Cruto (A.). **Further Researches on the Preservation of Insulin.**—*Jl. Trop. Med. & Hyg.* 1926. Jan. 1. Vol. 29. No. 1. pp. 1–2. [4 refs.]

The conclusion is as follows: "Insulin should be kept in solid form because, as shown by experiments, it does not undergo any alteration at a high temperature, and can be preserved for an unlimited length of time. The cause of the difference in preservation of insulin in liquid form lies in the fact that a hydrolysis of the product causes a deterioration in its pharmaco-dyamic properties."

A. G. B.

Chopra (R. N.), assisted by Ghosh (N. N.). **Some Medicina Plants growing in the Himalayas.**—*Indian Jl. Med. Res.* 1926. Jan. Vol. 13. No. 3. pp. 533–537. [3 refs.]

Major Chopra, Professor of Pharmacology, Calcutta School of Tropical Medicine, and Mr. Ghosh, Research Chemist, have examined medicinal plants sent from Kashmir. Several species of *Valeriana* grow wild in the temperate Himalayas including *V. officinalis*. A specimen of *V. Wallichi* contained 0·3 per cent. of the essential oil as compared with 0·5–0·8 from the imported root, but it had not been carefully preserved. Many species of *Artemisia* grow in the Himalayas, and *A. brevifolia*, which contains santonin, fairly abundantly in parts of Kashmir. Experiments carried out at Dehra Dun show that santonin is present from the first week of July to the middle of September, i.e., from the time young flower buds make their appearance till they develop

into open flowers. The maximum yields varied from 0·1 to 1·0 per cent., as compared with 1·2 to 1·4 for Russian Artemisia. The easiest and cheapest method of collection is to strip off the leaves and flower buds by hand and dry them in the sun. The plants so treated appear to be undamaged in their future growth and development, and the method entails less labour and transport than cutting. Kashmir can produce enough santonin for the whole of India and export a large surplus as well. It has been tested clinically and found just as good as, if not better than, the Russian product.

Several species of Hyoscyamus are found in India; a sample from Kashmir contained ·03 per cent. of alkaloids as compared with 0·065 in the B.P. drug. *Atropa belladonna* grows abundantly. The Kashmir roots contain 0·81 per cent. alkaloids as compared with 0·45 of the B.P. Large quantities of belladonna root are exported to Europe and returned as atropine and hyoscine. *Podophyllum emodi* is found in the Himalayas: the Indian rhizome yields 10 to 12 per cent. resin as against 4 per cent. for the American, and the resin is quite as active.

Digitalis purpurea is not native in the Himalayas, but is cultivated: the Kashmir leaf was found to be as good as the best available from Europe. The imported tincture soon loses a large part of its potency, so that there is advantage in using freshly made tinctures from the local product.

[The Indigenous Drugs Enquiry has already justified its existence. It is curious to read that neither santonin, belladonna nor hyoscyamus are used in Hindu medicine.]

A. G. B.

CHOPRA (R. N.) & DE (Premankur). **Indian Digitalis.**—*Indian Med. Gaz.* 1926. Mar. Vol. 61. No. 3. pp. 117–120. [3 refs.]

Most of the digitalis used in India is imported, and the loss of potency in a short time reaches 20 to 40 per cent. [see this *Bulletin,* Vol. 22, p. 993]. Hence this examination of Indian grown digitalis. It was found that digitalis of good quality grows in both Northern and Eastern Himalayas (Kashmir and Mungpoo), but the leaf of the Nilgiri Hills is, according to animal experiment, more toxic. Further clinical trials of the Mungpoo leaf are advised. Improvements are recommended in the methods of drying and storage of the native product.

A. G. B.

CHOPRA (R. N.) & DE (Premankur). **Biological Assay of Digitalis Preparations in the Tropics.**—*Indian Jl. Med. Res.* 1926. Apr. Vol. 13. No. 4. pp. 781–787.

The authors found the "frog method" of digitalis assay unsuitable for the climate of Calcutta. A modification of HATCHER and BRODY'S "cat method," consisting in studying the heart of the animal used for assay with the stethoscope, gave better results. A fair idea can be obtained of the therapeutic potency of an ordinary tincture by careful attention to four stated factors. In the case of toxic tinctures clinical tests alone give reliable information of therapeutic efficacy.

A. G. B.

CHOPRA (R. N.) & DE (Premankur). **Variations in the Potency of Digitalis Preparations in the Tropics (II).**—*Indian Med. Gaz.* 1926. May. Vol. 61. No. 5. pp. 212—214. [6 refs.]

Messrs. Parke, Davis & Co. have recently imported to India a powerful digitalis tincture 50 per cent. stronger than that of the U.S. Pharmacopoeia ; it is called Digifortis, and can be used for 12 months. The authors have given doses up to 30 minims with satisfaction to themselves and the patients. Seven specimens of this were tested for their keeping properties, and the results are tabulated ; five kept their potency fairly well for about 12 months, and one which did not was nearly 20 months old. A practical test of activity is as follows : if when diluted with 9 parts of physiological saline or water the tincture has a light, uniformly opalescent, greenish colour, it is good ; if on dilution it is blackish and contains fine black floating particles it is probably deteriorated.

A. G. B.

CHANDLER (A. C.) & CHOPRA (R. N.). **Effects of the Administration of Sugar, Magnesium Sulphate, Sodium Citrate and Dilute Acid on the Liver Damage done by Carbon Tetrachloride.**—*Indian Jl. Med. Res.* 1926. July. Vol. 14. No. 1. pp. 219–226. With 9 figs. on 3 plates. [3 refs.]

The authors' experience of the tolerance of cats for CCl_4 has been contrary to that of HALL and SHILLINGER (*J. Agr. Res.*, Vol. 23. No. 3, pp. 163–92), and they now state " that carbon tetrachloride is extremely toxic to cats, very much more so than to dogs," the liver and kidneys being severely damaged. " Practically the same results were obtained from 0·25 cc., 0·5 cc. and 4 cc. per kilo."

They studied the effects of the administration of sugar, sodium citrate, sodium bicarbonate and of purges upon the toxic effects of CCl_4, with the following results :—

Sugar.—Of doubtful value for controlling safety of administration. Avoidance of starvation and of a fat diet and encouragement of carbohydrate and protein is sufficient.

Sodium citrate and bicarbonate.—Given with CCl_4 tend to reduce amount of absorption and lessen danger.

Purges.—Undoubtedly helped by hastening elimination and so reducing amount of absorption.

J. F. C. H.

LAMSON (Paul D.) & WING (Raymond). **Early Cirrhosis of the Liver produced in Dogs by Carbon Tetrachloride.**—*Jl. Pharm. & Experim. Therap.* 1926. Oct. Vol. 29. No. 1. pp. 191–202. With 8 text figs. [4 refs.]

In continuation of previous experiments on dogs by the senior author and others [see this *Bulletin*, Vol. 20, p. 922 ; Vol. 21, p. 411] dogs were treated over a period of months with small and large doses of carbon tetrachloride, with alcohol, and with alcohol and tetrachloride in association. The conclusions are as follows :—

" 1. Carbon tetrachloride, in doses of 3 to 25 cc., may be given to dogs at intervals of approximately two days over a period of at least 15 weeks without loss of weight or disturbance in the apparent health of the animal.

"2. The therapeutic dose of carbon tetrachloride (3 cc.) may also be given with large doses of alcohol (25 cc. of 50 per cent. alcohol) at intervals of approximately two days over a period of at least 15 weeks with no loss of weight or disturbance in the apparent health of the animal.

"3. The continued administration of carbon tetrachloride alone, in small or large doses, or given together with alcohol, produces lesions, all of which are of the same type and of approximately the same severity.

"4. The lesions found are those of early cirrhosis of the liver, and it is believed from their appearance that a more prolonged treatment with this drug will produce a true Laennec cirrhosis with circulatory obstruction."

A. G. B.

DUYCK. Un cas de stomatite ulcero-membraneuse consecutive à un traitement bismuthique. **A Case of Ulcero-membranous Stomatitis following Bismuth Treatment.** —*Bull. Méd. du Katanga.* 1926. Aug. Vol. 3. No. 3. pp. 100–102.

A native was admitted to hospital with symptoms of tick fever; spirochaetes were found in his blood. He received in 30 days seven injections of neosalvarsan, a total of 4·05 gm., but relapses occurred at intervals of nine days, and four other patients treated about the same time behaved similarly. Each then received an injection of 2 cc. of bismuthyl every four days without effect on the disease, and after the fifth dose a return was made to neosalvarsan. Ten days after the last bismuth injection the first patient's submaxillary glands were noticed to be swollen, a bluish line was present on the gums and an ulcer on the mucous surface of the cheek. Treatment was by intravenous neosalvarsan and a wash of hydrogen peroxide. The ulceration extended with spread of oedema till it was difficult to feed him, but after ten days he began to amend, and eventually the mouth was almost recovered, though his general condition was bad. The author draws attention to the severity of the symptoms after so small a dose of bismuth (1 gm. of Bi) and notes that the other patients did not show symptoms.

A. G. B.

CHENOY (C. F.). **A Case of Death due to Bismuth Injection.**—*Indian Med. Gaz.* 1926. May. Vol. 61. No. 5. p. 234.

Death following upon symptoms of palpitation, thoracic pain, marked dyspnoea, sweating, weak rapid pulse and respiration, cramps and paresis of legs, occurred two hours after an intragluteal injection of neo-trepol. The author surmises that the drug was given into a vein instead of into the muscle. [No mention is made of the disease from which the patient was suffering.]

H. S. S.

MAY (Etienne). Un cas de mort par le tréparsol. [**Case of Death caused by Treparsol.**] —*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. July 8. Year 42. 3rd Ser. Vol. 50. No. 24. pp. 1176–1178.

A woman, aged 43, in early pregnancy, having had two miscarriages, though there was no sign of syphilis and both she and her husband had a negative W.R., was advised by a specialist to take treparsol. The prescription enjoined daily doses for four days, beginning with one

tablet and ending with four, ten in all or 2·5 gm. On the third day there was complaint of stomach ache and colic; on the fifth day these symptoms increased: on the sixth there was vomiting with streaks of blood and in the evening hemiplegia and loss of consciousness, vomiting of black blood, and death 12 hours later.

The author believes that this is the first published case of death from treparsol poisoning, though larger doses have been frequently given. He thinks that one should always begin with small doses, not inceasing them, at least in the first course. The patient should be under medical supervision, just as in the case of arsenicals given with the needle, and the treatment broken off at the first sign of intolerance. Lastly, since there is a risk in antisyphilitic treatment it should not be advised without sufficient reasons.

A. G. B.

GUPTA (Tara Pada Sen). **Unusual Symptoms following the Administration of Urea-Stibamine.**—*Indian Med. Gaz.* 1926. Aug. Vol. 61. No. 8. p. 394.

Following an injection of 0·05 gm. of urea stibamine to a patient, aged 60, with symptoms of kala azar (aldehyde reaction positive) there was delirium, with temperature 103 F., and a sensation of something "passing under the skin of the hands, face and head." The symptoms wore off in a week and the treatment was completed, without further incident, with tartar emetic.

A. G. B.

CHATTERJEE (N.). **A Case of Severe Anaphylactic Reaction following Injection of Amino-Stiburea.** *Indian Med. Gaz.* 1926. June. Vol. 61. No. 6. p. 284.

A lady of 18, with intermittent fever and large spleen and liver, and probably suffering from kala azar, received three injections of aminostiburea. The fourth injection, given at the author's dispensary, was followed at once by urticaria with oedema of the eyelids, and dyspnoea of such urgency that he plunged a scalpel into the trachea, while his assistant gave a hypodermic injection of pituitrin. Dr. NAPIER has seen a similar case after injection of stibosan. The editor agrees that the condition is one of anaphylaxis.

A. G. B.

DE PASCALIS (Francesco). Avvelenamento mediante semi di ricino. **Poisoning by Castor-Oil Seeds.** *Policlinico.* Sez. Prat. 1926. May 17. Vol. 33. No. 20. pp. 691–692.

A girl, 17 years of age, ate three fresh seeds of the castor-oil plant and suffered for a time with symptoms of considerable severity. She was restless and drowsy, with some cyanosis, tremors, rapid shallow respirations and clammy sweats. After washing out of the stomach and administration of stimulant, caffeine and ether, recovery was fairly prompt, though nausea and loose stools continued for another 48 hours.

H. Harold Scott.

SARKAR (Sarasi Lall). **Katakar Oil Poisoning.**—*Indian Med. Gaz.* 1926. Feb. Vol. 61. No. 2. pp. 62–63.

Katakar oil is obtained from the seeds of an American weed, *Argemone mexicana* Linn., common in the district and known as the Mexican prickly poppy. The oil is used medicinally for skin diseases. Mustard oil was prepared inadvertently in an oil mill previously utilized for the preparation of katakar oil, and used for the frying of cakes for three households, consisting in all of 28 persons. All were poisoned and two died. The symptoms were vomiting and diarrhoea followed by oedema of the feet and legs. Oedema remained in some instances a month later. [The oil from the seeds of this plant is reported in LYON'S "Medical Jurisprudence" as causing vomiting and purging.]

A. G. B.

PETRAROIA (Matteo). Su di un caso letale di lupinosi nell' uomo. (Avvelenamento per ingestione di semi secchi di lupino.) [**A Fatal Case of Lupine Poisoning.** —*Policlinico.* Sez. Prat. 1926. Sept. 27. Vol. 33. No. 39. pp. 1356–1357.

A child of 17 months was brought to the author in a state of complete unconsciousness and muscular flaccidity. In the morning it had vomited and brought up about a dozen seeds of the lupine plant. In spite of all treatment, by injected emetics, washing out, stimulation, etc., the child died on the evening of the following day, without recovering consciousness.

There are many species of Lupine ; the one in common use is *L. luteus*, which is prepared for food by boiling, then placed in a bag in running water for several days. After this it is eaten with impunity. The seeds contain two alkaloids, lupinin and lupinidin, and possibly a third, lupanin, and also a glucoside. Experiments in animals –guineapigs, rabbits, sheep—show that the alkaloids have an intense depressive action on the nervous centres, producing motor paralysis and diminution of sensation and abolition of the sense of pain. The post-mortem findings in sheep are atrophy of the liver, which is yellow and soft, inflamed kidneys and casts in the urine. Haemorrhagic extravasation are present in the intestine, peritoneum, endocardium, and mediastinum, and oedema of the lungs and meninges.

In cases of chronic poisoning the liver is like that of phosphorus poisoning, with fatty degeneration of the kidneys also. The question of lupine poisoning is worthy of further study.

H. Harold Scott.

RAJAN (R. Sundara). **An Interesting Case of Narcotic Poisoning and Recovery.**—*Indian Med. Gaz.* 1926. Mar. Vol. 61. No. 3. pp. 128–129.

An Indian native took as a purgative ground roots of the blue variety of *Clitoria ternatea* (N.O. Leguminosae). After some five actions of the bowels he became unconscious, and so remained for 30 hours, in a condition as of cerebral irritation, but attending to the calls of nature. Loss of memory for the succeeding fortnight preceded his complete recovery.

A. G. B.

ONORATO (Raffaele). Le sieroreazioni diagnostiche nella sifilide e nelle malattie tropicali. [**Serum-Reactions in the Diagnosis of Syphilis and of Tropical Diseases.** —*Arch. Ital. Sci. Med. Colon.* Tripoli. 1925. Jan.–Feb.–Mar.; Apr.–May–June; July–Aug.; Sept.–Oct.; Nov.–Dec. Vol. 6. Nos. 1–2–3, 4–5–6, 7–8, 9–10, & 11–12. pp. 1–11; 23–41; 55–75; 87–117; 131–166. [65 refs.]

It is impossible to abstract in the space available an article which appeared in parts in each issue of a medical journal throughout an entire year. Indications only of the subjects dealt with can be given. The author carried out examinations with some thousands of sera, comprising those from healthy individuals, and those from cases of syphilis (hereditary and acquired), of phagedaenic ulcer, yaws, malaria, leishmaniasis (cutaneous and visceral), leprosy, granuloma venereum, bronchial spirochaetosis, and other diseases. He tested these by the original Wassermann reaction and by the various modifications of, and subsequent developments from, it. Among these were the methods of MICHAELIS, PORGES and MEIER, LANDAU, and KLAUSNER. He shows by tables of comparison, as well as by discussion in the text, that none of these can really replace WASSERMANN'S own method.

He then performed similar tests with the technique of SACHS-GEORGI, MEINICKE, GATÈ and PAPACOSTAS (formol-gel) and others. The first of these was carried out simultaneously with the Wassermann reaction, on 948 sera, and it was found that there was a very close resemblance, the W.R. being slightly superior. With regard to the formol-gel test he agrees with the generality of workers in placing but little reliance upon it in syphilis. Of the Meinicke reactions he describes four, of which the third modification (known in Germany as D.M.) is considered to be a very efficient substitute for the Wassermann reaction, and the fourth, known as M.T.R. (Meinicke's Turbidity Reaction), is equally serviceable. The author discusses the method and, as far as is possible, the rationale of each, and while one cannot but admire the energy and perseverance which could undertake and carry through such a vast amount of what must have been somewhat tedious work, we think that it would be most serviceable if the whole were published in book form rather than in a series of contributions to a medical periodical.

H. H. S.

HEINEMANN (H.) & HEINEMANN (Lotte). Untersuchungen ueber den Liquor cerebrospinalis. 4. Mitteilung.* [**Examinations of the Cerebrospinal Fluid. No. 4.** —*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Feb. 1. Vol 30. No. 2. pp. 61–72. With 2 charts in text. [1 ref.]

A further contribution from these authors on the investigation of the cerebrospinal fluid in patients in Sumatra. The tables and graphs disclosing the results of this reserach cannot be "abstracted." They employed the Gold-Sol reaction (Technik Lange-Weigelt) and the Mastix reaction as described by JACOBSTAL and KAFKA (Handbuch der Serodiagnose der Syphilis.— J. Springer, Berlin). The series studied in their paper comprised 104 Javanese and 33 Chinese cases. Their results show that a positive Wassermann C.S.F. was obtained only in

* Previous contributions in this series were noticed in Vol. 21, p. 612, and Vol. 23, p. 220.

syphilis: it was not obtained in malaria. Though checked by examination of the C.S.F. of over a hundred control cases suffering from various illnesses, a non-syphilitic positive Wassermann C.S.F. was never found. They consider that examination of the C.S.F. is of the greatest value in clearing up a diagnosis where the blood test is doubtful. A positive Wassermann in the C.S.F. is of absolute value. It is more difficult to interpret the results of the colloid reaction in the C.S.F. It is known that this is not a specific reaction; and their research shows that, in the tropics, it must be interpreted with especial caution. They reserve for a future paper full discussion of the question where, in positive colloid reactions in the C.S.F., lies the borderline between normal and pathological. In their patients the colloid reaction proved to be very delicate. In sensitiveness the Gold-Sol reaction surpassed the Mastix reaction.

Thus:—

		Positive Gold-Sol.	*Positive Mastix.*
Javanese.			
Lues.—Framboesia group ...	57 cases	72 per cent.	65 per cent.
Other diseases	47 ,,	74 ,, ,,	34 ,, ,,
Chinese.			
Lues	23 cases	87 per cent.	83 per cent.
Other diseases	10 ,,	80 ,, ,,	40 ,, ,,

In 70 per cent. of cases the Gold-Sol and Mastix reactions were the same—they differed in 30 per cent. of cases, and of these last $\frac{4}{5}$ths were only Gold-Sol positive, $\frac{1}{5}$th only Mastix positive. When the Gold-Sol and Mastix reactions differed, malaria was often the cause. While in malaria some $\frac{4}{5}$ths of the cases show a Gold-Sol reaction, only $\frac{1}{3}$rd give a positive Mastix reaction. In yaws, $\frac{1}{4}$th give only Gold-Sol positive reaction and $\frac{2}{3}$rds a positive Mastix reaction. The significance of these differing reactions will be discussed in a future paper.

H. M. H.

CASTELLANI (Aldo). **Observations on the Importance of Symbiosis or Close Association of Different Species of Organisms in the Production of certain Biochemical Phenomena and in the Causation of certain Diseases and certain Symptoms of Disease.** *Jl. Trop. Med. & Hyg.* 1926. Aug. 2. Vol. 29. No. 15. pp. 217–226. With 5 text figs. [10 refs.]

In this article the author illustrates and extends his views upon the effects produced by micro-organisms in symbiosis or close association, [see this *Bulletin*, Vol. 23, p. 214, CASTELLANI; p. 632, FIALLOS]. Numerous examples of these associations are given, with details. Thus *B. typhosus* forms acid only, never gas, from maltose, mannite, and sorbite, while *B. proteus* has no action on these substances, but their mixture produces both acidity and gas. Two organisms, *B. vermiculoides* and *Cryptococcus graciloides*, isolated from cases of stomatitis (Vol. 23, p. 438) slowly give rise together to gas formation from glucose, levulose and maltose, but do not do so individually. Baker's yeast taken as a whole ferments, with the production of gas, more carbohydrates than any of the single organisms isolated from it. The reverse phenomenon—that is to say, inhibition of gas formation by organisms when grown in association—has also been observed. *Monilia tropicalis* produces gas from saccharose, while *B. typhosus* does not; if the former be grown along with the latter, no fermentation of the saccharose occurs.

The author lays stress in this paper on the importance of symbiosis or close association of organisms in the aetiology of certain diseases. Three examples are given of diseases in which symbiosis or close association of two organisms is apparently the true cause. The diseases are not important except from the scientific standpoint. They are: (1) *Trichomycosis nigra*, a disease of the hair due to organisms named *Nocardia tenuis* and *Micrococcus nigrescens*; (2) *Trichomycosis rubra*; (3) *Stomatitis Cryptococco-bacillaris*, the lesions of which are quite different in appearance from thrush. Symbiosis of organisms, where the term symbiosis is used in a broad sense, occurs in a number of affections. The pustular eruptions in scabies, copra itch and yaws are due to pyogenic cocci. Meteorism in typhoid fever may possibly be due to association of *B. typhosus* and *B. morgani*, neither of which alone produces gas. Favus is accompanied by a mousy smell, which it would appear is not due to the fungus directly but to associated bacteria. Thus, it is contended that "certain so-called typical symptoms of diseases of which we know the specific organisms are in all probability due, not to the specific germ alone, but to the association of the specific germ plus one or more non-specific organisms."

W. F. Harvey.

SAVATIEF (A.). Contribution à l'étude de la pathologie des animaux de laboratoire. **Pathology of Laboratory Animals.** —*Russian Jl. Trop. Med.* 1926. No. 2. French summary pp. 56–57. [In Russian.]

The diseases which spontaneously occur in rabbits are enumerated, in so far as they were observed in 1,641 autopsies. These affections are found in relation to the skin; the nervous system; heart, lungs, pleura, and respiratory passages; peritoneum, small and large intestine, mesenteric glands, liver, spleen and kidney, suprarenal, thyroid and thymus glands.

W. F. H.

BAINE (A.). Le séro-diagnostic sans laboratoire. **Serum Diagnosis without Laboratory.** *Arch. Méd. et Pharm. Nav.* 1926. Apr.-May–June. Vol. 116. No. 2. pp. 120–131.

The serum-diagnosis referred to is that of macroscopic agglutination and intended to be used by clinicians, especially maritime and colonial medical officers. It is important that the strain used for the suspension be easily agglutinable and *B. paratyphosus A* is the organism to which this remark particularly applies. The suspension recommended is one of a 24-hour agar growth of bacteria in 0·77 per cent. sod. fluoride. It should not be too concentrated; 800 million organisms per cc. is sufficient to give clear cut results. These suspensions are put up in sealed tubes, kept at 40° C. for 48 hours, and are utilizable over a period of years if necessary.

W. F. H.

REITER (Hans). Versuche ueber perorale Immunisierung. [**Oral Immunization.** —*Deut. Med. Woch.* 1926. June 4. Vol. 52. No. 23. pp. 946–949.

The author points out in the text that his experiments, so far as they go, do not present very clear results for the action of sodium benzoate

in promoting the immunizing power of vaccines given *per os*. Its action, however, is considered to be similar to that of bile and salts of bile acids in producing an increase of the permeability of the gastro-intestinal wall. His conclusions are :—

1. Successful immunization *per os* can be attained in animals against typhoid, dysentery and other organisms.

2. Oral administration of a dose of 5 to 10 per cent. sodium benzoate 1 to 3 hours previous to a vaccine, preferably on an empty stomach, can increase permeability. In the trials made, acceleration of immunizing action was to some extent counterbalanced by an action destructive to the immunizing power of the vaccine.

3. The special part played by the mucous membrane of the gut in the production of protective substances is undecided. The immunity developed through oral administration is not merely a local one, but is general.

4. The degree to which the results of experiment are applicable to man must be tried out on human beings.

W. F. H.

ALESSANDRINI (A.) & SETTE (N.). Conservazione quadriennale in sangue di coniglio del virus di Danysz allo stato di virulenza. [**Maintenance of the Virulence of Danysz Virus for Four Years in Rabbits' Blood.**]—*Ann. d'Igiene.* 1926. June. Vol. 36. No. 6. pp. 433–440. [19 refs.]

By passage through mice, first by intraperitoneal, then by subcutaneous injection of the organism, and finally *per os* mixed with grain, a degree of virulence is obtained such as will kill a rabbit in 4–6 days after intravenous inoculation. Ten hours after inoculation a vein is opened, the blood obtained is defibrinated, placed in a thermostat at 37° C., and then tubed and sealed. Some virus which had been thus kept for as long as four years was found to have retained its virulence ; mice fed with an 18-hour agar culture from this, mixed with grain, died in 4–6 days ; one-thirtieth of an ordinary loopful inoculated subcutaneously killed in 12–24 hours and the same amount intraperitoneally in 20 hours. When deposited on the conjunctiva death resulted in 6–8 days. In all cases the post-mortem findings were those produced by the bacillus in the intestine, liver and spleen.

The maintenance of virulence is ascribed to two facts : First, that there is very little oxygen present, and, secondly, that the pabulum is a favourable one and of constant composition.

H. Harold Scott.

RÉGNIER (Robert) & PUSSARD (Roger). Des conditions dans lesquelles se propage la maladie communiquée aux campagnols par le virus de Danysz. [**Conditions of Transmission of an Epidemic by Danysz Virus to Field Mice.**]—*C. R. Acad. Sci.* 1926. Aug. 23. Vol. 183. No. 8. pp. 451–452.

Stress is laid upon the necessity of dealing with a plague of field mice by an extensive campaign. It is not sufficient to infect a few individuals with Danysz virus to bring about the desired general epizootic. From September to January the field mice congregate in their nests. Infected animals die in their nests and the galleries, and serve, through faecal contamination or perhaps parasites such as fleas, to transmit the disease to others. They also devour one another and infection is

brought about in this way. But this is all a somewhat accidental mode of transmission of the disease, and not sufficiently certain. To be effective infection must be distributed throughout the whole invaded area and its surroundings, while supplementary treatment with gas, poisoned baits and repetition of infection is also required.

W. F. Harvey.

MEYER (K. F.) & BATCHELDER (A.). **Local Immunization of Guinea Pigs to Cutaneous Infection with a Pasteurella isolated from Wild Rats.**—*Proc. Soc. Experim. Biol. & Med.* 1926. May. Vol. 23, No. 8. pp. 730–734. [3 refs.]

A pasteurella infection of wild rats had been found, which caused confusion in the rapid diagnosis of chronic rodent plague. Like its congener *B. pestis*, this organism caused the death of guineapigs when tissues containing it were rubbed into carefully shaven skin. This skin test is one of the most delicate and rapid methods of recognition of infected plague material. Three experiments were instituted which had for their object the proof of what is given as the title of this preliminary communication. These experiments were :—

1. The filtrate through a Berkefeld V candle, obtained from 18-day shallow cultures at 28° C. of virulent strains of the rat pasteurella, was itself lethal to guineapigs in intracutaneous doses of 0·5 cc. When this filtrate was sown with pasteurella it proved inhibitory to further growth ; that is, it apparently contained " anti-virus " of Besredka. The medium of growth was beef heart-hormone broth of pH7·0.

2. A filtrate similar to that in the first experiment was prepared but from growths in deep culture. It was not inhibitory to further growth of the pasteurella and therefore contained no " anti-virus." Neither did the filtrate show toxic effect on intracutaneous inoculation of 0·3 cc., nor were the inoculated guineapigs in any way immune to subsequent test by rubbing of virulent spleen material into the slightly scarified skin.

3. The same method of preparation of filtrate was employed as in No. 1, but the incubation of cultures was for seven days only. This filtrate contained " anti-virus " and was inoculated intracutaneously in doses of 0·3 cc. The tests, for which also proper controls were used, consisted in the application at intervals of 18, 24, 48, 72 hours and 5 and 8 days of crushed spleen fragments of an infected guineapig either on the mucous membrane of the nose, to the slightly scarified skin, or in a subcutaneous pocket. Complete protection to the surface infection manifested itself in these guineapigs, but not to the subcutaneous infection.

The authors conclude that in guineapigs they have " established the possibility of protecting the entire integumentum inside of 18 hours, but not the subcutaneous tissues, when non toxic filtrates prepared from seven days old cultures grown in shallow layers, containing a growth inhibiting substance or antivirus, are inoculated intracutaneously."

W. F. H.

OTTEN (L.). Die Differentialdiagnose zwischen den Erregern der hämorrhagischen Septikämien. (*Bac. pestis, Pseudotuberculosis rodentium* und *Pluriseptieus*.) **Differentiation of the Organisms of Haemorrhagic Septicaemias.** *Cent. f. Bakt.* I. Abt. Orig. 1926. June 7. Vol. 98. No. 7–8. pp. 484–492. With 2 folding plates. [17 refs.]

Under the designation organisms of the haemorrhagic septicaemia group are included many ill-described species or subgroups of bacteria.

The existing descriptions too are often contradictory. The particular bacteria specifically known as *B. pestis*, *B. pseudotuberculosis rodentium*, and *B. plurisepticus* are investigated for differential characters, apart from their clinical manifestations or the particular animal in which they commonly produce disease. It is very desirable that these organisms, which give rise in nature to disease in animals and so may cause confusion in animal tests for the recognition of the bacillus of plague, should be specifically separated. The strains tested were six of each of the organisms and the character investigated was the hydrogen-ion concentration produced after 1, 3, and 7 days in 0·5 per cent. peptone water containing 0·5, 0·25, 0·1 and 0·05 per cent. glucose respectively. A definite measurable colour reaction was obtained in this medium, with litmus as indicator, and this was consistently distinctive for each of the test organisms; thus, for example, the pH readings after three days' growth in 0·05 per cent. glucose peptone water were 5·0–5·4, 6·3–6·7 and 5·8–6·2 for *B. pestis*, *B. pseudotuberculosis rodentium* and *B. plurisepticus* respectively.

W. F. H.

NICOLLE (Charles) & LUMBROSO (Ugo). Recherches sur les conjonctivites granuleuses naturelles de quelques animaux de laboratoire, en particulier du lapin. Leur importance dans l'étude experimentale du trachome humain. **Granular Conjunctivites of Laboratory Animals. Importance for the Study of Trachoma.**—*Arch. Inst. Pasteur de Tunis.* 1926. Sept. Vol. 15. No. 3. pp. 240–266. [1 ref.]

Previous work had shown the possibility of inoculation of human trachoma virus on the rabbit's conjunctiva. But very considerable doubt is now raised by the authors as to the validity of this transmission. The reason for their new point of view is that the rabbits of Tunis are almost universally affected by lesions which take the form of areas of granulation or isolated granules. These had formerly been taken to be normal histological appearances but are now shown to be granulations, especially liable to be stimulated into activity by scarification of the conjunctiva. They are inoculable from rabbit to rabbit and from rabbit to the conjunctiva of monkeys; special care has to be taken to ensure the freedom of the monkey itself from similar granulations, because it also suffers from this condition. And thus the conclusion is reached that inoculation of human trachomatous virus to the rabbit does not give rise to any specific lesion but to lesions similar to those which are produced by the natural granulation virus of the rabbit. It is therefore impossible to know, by the results obtained, whether human trachoma virus has really ever developed on the conjunctiva of the rabbit. Some facts seem to indicate that the rabbit virus is derived from the soil.

W. F. H.

DURAND (Paul) & LUMBROSO (Ugo). Recherches sur le bacille de Weeks. **Bacillus of Weeks.**—*Arch. Inst. Pasteur de Tunis.* 1926. June. Vol. 15. No. 2. pp. 71–92.

This is a study in some detail. As criterion the authors have taken: Conjunctival origin; a long rather slender bacillus, sometimes cocco-bacillary; Gram-negative; growing freely on media containing heated

blood or blood extracts, less freely on media containing unheated blood, and not at all on ordinary media. Other characters investigated are habitat, fermentation of sugars, production of indol, power of reducing nitrates, haemolytic power, agglutination and saturation reactions, animal inoculation and virulence for man. The authors lay stress on their use of washed bacilli for agglutination tests and of agglutination sera obtained by immunization with single strains. Divergence of results make characterization difficult. The power of reducing nitrates and absence of haemolytic power were constant in the strains used. It was not possible to produce conjunctivitis by instillation of the bacillus in monkeys, rabbits, guineapigs, sheep, dogs, horses, etc., but in human volunteers seven positive results were obtained out of 24. A strain of the bacillus of Pfeiffer did not give conjunctivitis in man. The authors conclude that, except for its conjunctival origin and virulence, the bacillus of Weeks does not differ morphologically, culturally, biochemically or serologically from the bacillus of Pfeiffer.

W. F. H.

DURAND (P.), ANDERSON (Ch.) & LUMBROSO (Ugo). Bacille de Weeks, bacille de Pfeiffer et agglutination acide. **Bacillus of Weeks, Bacillus of Pfeiffer, and Acid Agglutination.** *Arch. Inst. Pasteur de Tunis.* 1926. June. Vol. 15. No. 2. pp. 93-100. [10 refs.]

The acid solutions used were: (1) mixtures of lactic acid and sod. lactate of increasing ionization; (2) the same series diluted 1-6 with doubly distilled water, and (3) solutions of acetic acid of the same pH as the preceding. The test organisms were grown on heated blood agar, washed in distilled water, and made up in a suspension of about 2 mgms. per cc. Care was taken that the glassware used should be strictly neutral. The acid solutions were distributed in amounts of 1 cc. in test tubes and ½ cc. of bacterial suspension added: the agglutination results were read after 12 to 15 hours at 37° C. These results were very much the same for both the bacillus of Weeks and the bacillus of Pfeiffer with the acetic acid solutions, but significantly different in the case of the undiluted lactic acid mixtures. Thus acid agglutination proves to be the only method by which these two groups of allied organisms are distinguishable *in vitro*.

W. F. H.

DURAND (Paul). Technique de l'isolement du streptobacille de Ducrey. **Isolation of Ducrey's Bacillus.** *Arch. Inst. Pasteur de Tunis.* 1926. June. Vol. 15. No. 2. pp. 118–127. [9 refs.]

The bacillus of Ducrey or streptobacillus of soft chancre is difficult to grow with certainty.

Technique.

(1) Add aseptically to 150 cc. 3 per cent. melted agar of pH7·6 at about 45° C. 30 to 50 cc. defibrinated sheep blood. (2) Mix with care and distribute in test tubes. (3) Allow the blood agar to solidify in the sloped position. (4) Cleanse the surface of the open chancre carefully with sterile gauze. (5) Apply, with some pressure, tincture of iodine for 3 or 4 seconds. (6) Remove excess of iodine with alcohol and dry with sterile gauze. (7) Squeeze the base of the chancre between finger and thumb. (8) Take up the drop of serum which gradually exudes, in a capillary pipette. (9) Sow 4 or 5 blood agar tubes in succession with this material. (10) Incubate at 37° C., or better at 35 to 36° C. (11) Examine the tubes at the end of 24

or 48 hours for very regular, lozenge-like, whitish-grey, glistening colonies of the streptobacillus among the colonies of contaminating organisms. (12) Examine microscopically and particularly for long chains of bacilli in the water of condensation. (13) Subculture on sheep, rabbit, or human blood agar.

The technique of isolation is much easier if the soft chancre be unbroken or if the material be pus from a closed bubo. The author was able to grow the organisms successfully 39 times out of 40 cases.

W. F. H.

NOGUCHI (Hideyo). **A Filter-passing Virus obtained from** *Dermacentor andersoni.*—*Jl. Experim. Med.* 1926. July 1. Vol. 44. No. 1. pp. 1–10. With 4 charts in text. [4 refs.]

The tick *Dermacentor andersoni* is concerned with the transmission of Rocky Mountain spotted fever and of tularaemia. Four out of a collection of these ticks were used in tests for spotted fever virus and two of them gave positive results. Tick No. 3 contained an unusually large number of micro-organisms very similar to those of spotted fever ticks. The injection of a suspension of the viscera of this tick, however, produced in a guineapig a fever resembling spotted fever but conferring no immunity to that disease. The virus of tick No. 3 formed the subject of experiment. It is an aerobic, invisible, filter-passing virus and has been subcultured for seven generations at 37 C. No growth occurs in ordinary broth or agar, but a slight turbidity is produced in serum media containing mixed sugars. Guineapigs which have responded to the virus cannot be re-inoculated but can still be infected with spotted fever virus, and conversely. The spleen of an infected guineapig, which is much enlarged, is infective, as is also the blood. The fever is high and continuous. No micro-organisms have been seen in the spleen or blood of the animals. Ticks can be infected with the virus by feeding on infected guineapigs, and in one case the infection was transmitted by feeding from tick to guineapig.

W. F. H.

PEYRE (Edouard). Hémoglobinimètre de Sahli modifié pour exprimer en poids l'hémoglobine contenue dans le sang. [**Haemoglobinometer graduated for Weight of Haemoglobin.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. June 10. 3rd Ser. Year 42. Vol. 50. No. 20. pp. 920–921. With 1 text fig.

The author in this short note refers to the varied readings of different haemoglobinometers according to the basis taken. Those of Sahli or of Gowers are graduated at 100 per cent. for a value of 17·20 gm. haemoglobin per 100 gm. blood, whereas the mean normal is only 13 to 15 gm. He thinks that it would be simpler to express haemoglobin value gravimetrically. In such a case, the graduations 0 to 20 of a Sahli-Gower instrument would represent grammes of haemoglobin per 100 gm. of blood, instead of a percentage of the normal content.

W. F. H.

i. Köhler (Günther). Zur Verbreitung des Kropfes in Ostasien. [**The Distribution of Goitre in East Asia.**]—*Muench Med. Woch.* 1926. May 7. Vol. 73. No. 19. p. 781.

ii. Datta (J. K.). **Ear, Nose and Throat Diseases among Calcutta University Students.**—*Indian Med. Gaz.* 1926. Apr. Vol. 61. No. 4. pp. 168–173.

iii. Lesne (E.), Marquezy (R.) & Lambling (A.). Deux cas de méningococcémie prolongée à forme pseudo-palustre. Guérison après abcès térébenthiné. [**Two Cases of Prolonged Meningococcaemia simulating Malaria. Recovery after a Turpentine Abscess.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1926. Aug. 5. Year 42. 3rd Ser. Vol. 50. No. 28. pp. 1376–1381. With 2 text figs.

iv. Panayotatou (Angélique). Herpès et rougeole en Egypte. [**Herpes and Measles in Egypt.**]—*Rev. Méd. et Hyg. Trop.* 1926. Mar.-Apr. Vol. 18. No. 2. pp. 41–44.

v. Kenya Medical Journal. 1926. July. Vol. 3. No. 4. p. 119. [1 ref.]—**An Antidote to Arsenic, Bismuth and Mercury Poisoning.**

vi. Pringle-Patterson (A. E. S.). **Cases of Mushroom Poisoning in India.**—*Jl. Roy. Army Med. Corps.* 1926. Mar. Vol. 46. No. 3. pp. 210–211.

vii. Dilling (Walter J.). *Chlorocodon whiteii*: **its Constituents and their Pharmacological Actions.**—*Jl. Pharm. & Experim. Therap.* 1926. Jan. Vol. 26. No. 6. pp. 397–411. With 4 text figs. [5 refs.]

viii. Wittvrouwen. Rapport sur un cas d'intoxication par médicaments indigènes (dawa). [**A Case of Poisoning by Native Medicines.**]—*Bull. Méd. du Katanga.* 1926. Feb. Vol. 3. No. 1. pp. 19–20.

ix. Bayon (H. P.). **Virus Diseases of Bacteria, Plants and Vertebrates.**—*Jl. Trop. Med. & Hyg.* 1926. Jan. 15. Vol. 29. No. 2. pp. 17–37.

x. Phillips (John). **A Case of Endemic Funiculitis.**—*Indian Med. Gaz.* 1926. June. Vol. 61. No. 6. p. 287.

i. This brief article consists chiefly of extracts from geographers who have commented on the frequency of goitre in regions of Tibet, China, Shan States, etc. The regions are more or less defined, the incidences vague.

ii. A didactic article by a specialist, in which he draws attention to the neglect and ignorance of nose, throat and ear diseases in India, and the need in India for a comprehensive system of school medical examinations.

iii. The interest for us of these cases is the temperature chart, which in the first case, a child of five years, suggests quotidian fever, and in the second, a child aged two, tertian fever. Owing to the presence of other symptoms diagnosis was not difficult.

iv. Since herpes is rare in the eruptive fevers, the author records this case of measles and herpes in the same subject.

v. A reference to the use of the well-known remedy, sodium thiosulphate.

vi. Three persons were taken ill after dinner, which included unidentified mushrooms, with symptoms suggesting alcoholic poisoning; in one case no alcohol had been taken. After an emetic recovery was rapid.

vii. The conclusion formed from an examination of the roots of *Chlorocodon whiteii*, an Asclepiadaceous plant from tropical and subtropical Africa, is that it cannot merit a place in practical therapeutics.

viii. The notes of the analysis of the tissues and vegetable substances administered show that these contained strychnine and another alkaloid, the injection of which killed a frog.

ix. This is an attempt to bring the viruses together under one general conception. Though purely speculative in purpose and method, it is extremely interesting as a historical summary of the subject.

x. A brief record of this condition in a native, with recovery without suppuration. The editor says that acute funiculitis is occasionally met with in Bengal and is not infrequently fatal.

A. G. B.

REVIEWS AND NOTICES.

ZIEMANN (Hans) [Professor a. d. Univ., Berlin.] Hämatologisches Praktikum für Studierende und Ärzte. [**Haematological Practice for Students and Doctors.**]—pp. viii+166. With 34 figs. & 3 coloured plates. 1927. Berlin: Verlag von S. Karger, Karlstrasse 15. [M. 7.20.]

It is the avowed object of this handbook to afford the practitioner a general survey of haematology, and in small compass, its practical application to the diagnosis and treatment of disease; it therefore follows that the descriptions of the various blood elements and the methods by which they are studied are briefly and clearly set forth, while the more elementary processes, such as staining methods and the counting of the corpuscles, receive the same attention as the more highly technical investigations of the serum.

Following upon a concise account of the elements of the blood, both abnormal and normal, we are introduced to the bio-chemical aspects of haematology, many of which—as for instance, the albumin and globulin content of the plasma, are of doubtful clinical value, and have not, as yet, entered the purview of the general practitioner. The blood-forming organs, the bone-marrow, the spleen, the lymphatic system, and the embryology of the blood also receive some attention. A special section is devoted to pathological conditions of the blood, the various anaemias of infancy and adult age, and in order to economize space, the descriptions are often synoptical including short statements on diagnosis and treatment, but whether it would have been more advantageous to have entirely omitted this is certainly open to question. A feature of the latter portion of the book is a series of differential diagnostic tables of the leukaemias, purpuras and haemophilia. A more lengthy column sets forth the diagnostic significance of the differential blood count in the various blood infections known to medical science. It is, however, unwise to dogmatize too freely on the exact value of the minute changes in the character or proportions of the various leucocytes, and more especially is this true in surgical abdominal conditions. The description of the human blood parasites is disappointing and the text here is hardly illuminated by the illustrations; that of the Leishman-Donovan body and the *Spirochaeta recurrentis* could be greatly improved, while in the microfilariae details of the internal structure have been omitted. The subject-matter is thoroughly up to date. In malaria, Plasmochin receives adequate mention and its value in treatment is already assessed, though much confirmatory work still requires to be done. There is one coloured plate wherein the main blood cells are well depicted, though it must be admitted that the malaria parasites hardly attain the same high standard. To the reader unacquainted with the earlier literature of ROMANOWSKY'S work, it may be a matter of comment to find this stain rechristened the Romanowsky-Ziemann method.

The criticisms which have suggested themselves to the reviewer do not detract from the value of the book, which will take a definite place in the literature of haematology; it will assuredly be found on the bookshelf of the modern medical practitioner and should materially assist him in translating into practical language such blood-examinations as he, from time to time, may wish to have carried out. Ziemann's Praktikum has therefore fulfilled its aim in an admirable manner.

P. H. Manson-Bahr.

Recent Monographs on Helminthology.

BAYLIS (H. A.) [M.A., D.Sc., Brit. Museum (Nat. History)] & DAUBNEY (R.) [M.Sc., M.R.C.V.S., Vet. Res. Laboratory, Kabete, Kenya Colony.] **A Synopsis of the Families and Genera of Nematoda.**—pp. xxxvi—277. 1926. London: Printed by Order of the Trustees of the British Museum. [10s. 6d.]

STILES (C. W.) & HASSALL (Albert). **Key-Catalogue of the Worms reported for Man.**—*U.S. Public Health Service. Treasury Department. Hygienic Laboratory Bulletin No. 142.* Washington. 1926. Jan. pp. iv+69+196.

POCHE (Franz). **Das System der Platodaria.**—*Archiv. für Naturgeschichte.* 1925. 91st Year. Abt. A., Nos. 2 & 3. pp. 1–240, & 241–458. With 7 plates. 16 text-figs., & 1 geneological tree of the Digenea. [Issued in Jan. & Mar. 1926.]

MEGGITT (F. J.). [M.Sc., Ph.D., Prof. of Biology, Univ. of Rangoon.] **The Cestodes of Mammals.**—iv+282 pp. 1924. London. [Sold by Edw. Goldston, 25, Museum Street, W.C. 1. Price 6s.]

The year 1926 was remarkable in the recent history of Helminthology for the appearance of no less than three new efforts to codify the classification of parasitic worms. YORKE and MAPLESTONE, in a volume already reviewed in this *Bulletin*, Vol 23, p. 328, confined their attention to the "Nematode Parasites of Vertebrates." This, perhaps, was the most imposing and the most ambitious, although it omitted entirely the free-living forms and those parasitic forms met with in invertebrates. The various known and several new genera were classified and defined. Such species as appeared to the authors to be recognizable were listed. But no attempt was made to differentiate species save by indicating the principal hosts from which these had already been recorded.

Baylis and Daubney have produced a much less expensive, but for the medical parasitologist, in so far as it covers the same ground, a much less useful compilation. They have confined themselves to definitions of higher groups and of genera of Nematodes parasitic and free living—listing only the *type* species in each genus. To a practical worker in Helminthology, the formal definition of a genus may alone frequently be of little value; for every new species may bring about a need for the revision of previous generic concepts or necessitate the formation of a new genus. To workers in the tropics, therefore, a volume is of little help which provides, merely, the possibility of tentatively placing a specimen in a genus. It is, however, of considerable value to the systematist in museums and zoological laboratories by bringing into a single and easily accessible code the concepts of one of the leading systematists in this group of zoology.

Both these volumes acknowledge the assistance derived from the subjects' and authors' sections of the Index Catalogue of Medical and Veterinary Zoology, published by STILES and HASSALL. Indeed, to those working systematically in Helminthology, it is obvious that neither of these volumes could have been successfully compiled at the present time but for the vast mass of bibliographical information that these two American writers had accumulated.

These authors had themselves projected a systematization of their own work in the form of a Host Catalogue, and this is now appearing. Part II has been issued as the Hygienic Laboratory Bulletin No. 142 in January, 1926, and is entitled "Key-Catalogue of the Worms Reported for Man." It may be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a cost of 20 cents (plus postage).

Although the title of this latter publication suggests that it deals only with the parasites actually found in man, the authors have taken the opportunity to equip the reader with definitions of the higher groups, not merely of the

Nematoda, but also of the Trematoda and Cestoda; and they have (in the form of a series of footnotes which not infrequently extend over five-sixths of a page) given in abbreviated form many comprehensive keys to the families, sub-families and genera devised by previous writers. These keys extend beyond the host limitations defined in the title: and provide, in a less attractive form, the same formal kind of information as presented in the two monographs already mentioned.

The key catalogue is, further, of practical value to the field worker and to those in tropical laboratories, whose duty it may sometimes be to identify the less common parasites of man, for the definitions and differential tables extend to species and even to artefacts. The publication, however, shares with the others the defect that an untrained worker will find it extraordinarily difficult to recognize the structures so succinctly but so technically described, owing to the condensation which has necessarily resulted from an attempt to crowd into 120 pages such an enormous amount of information concerning differential diagnosis, nomenclature, vectors and reservoir hosts.

The authors state that the pamphlet has been prepared in its present style for use by the class in Medical Zoology at the Hygienic Laboratory, and it is intended to present a fairly comprehensive working reference index to the subject of Medical and Veterinary Zoology.

We cannot but admire the high standard which is now attainable in Parasitology by the personnel of the United States Public Health Service.

Those interested in the classification of Flatworms will find much cause for perturbation in a monograph "Das System der Platodaria," published in the *Archiv für Naturgeschichte* (Abteilung A) for 1925, but issued in January and March, 1926. Dr. Poche of Vienna, with Nelson gesture, sweeps a critical eye across the whole Platyhelmia creating Supersuperfamilies, Subtribes and Families galore which must engage the attention of all workers in helminthology for some time to come. This modern Linnaeus merely states the number of genera in the various families and leaves the unhappy reader to ascertain for himself how the number is made up.

A most useful and successful compilation and one which can be cordially commended to those concerned with the identification of tapeworms is a clearly printed and well arranged volume on "The Cestodes of Mammals," compiled by F. J. Meggitt, Ph.D., now Professor of Biology at Rangoon. This post-war contribution, which was printed abroad, and dated 1924, is now obtainable from E. Goldston, 25, Museum Street, London. Those who invested in German marks will be glad to find that one Englishman, at any rate, shrewdly turned the depreciated German currency to good and altruistic account: for the author by printing his monograph in Germany has been able to place it on the English market for the price of 6s. per copy—a cost absurdly low in comparison with English productions at the present time.

R. T. Leiper.